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CHARLES J. BONAPARTE

Mr. Charles J. Bonaparte, who became the secretary of the navy on July 1, is the grandson of Jerome Bonaparte. Jerome Bonaparte was one of the younger brothers of Napoleon Bonaparte and visited the United States on a cruise when



MR. CHARLES J. BONAPARTE.

Napoleon was first consul of France. He fell in love with Elizabeth Patterson of Baltimore and married her. Napoleon had meanwhile been elected by the French people to establish a new dynasty and he was accordingly greatly incensed at this marriage of his brother. He at no time recognized it and, notwithstanding Jerome's protestations, who would personally have greatly preferred to live in the United States with his wife, caused the marriage to be dissolved and compelled Jerome to return to France. In the subsequent distribution

of kingdoms Jerome was made king of Westphalia and married one of the princesses of Europe.

Mr. Charles J. Bonaparte is a grandson of Miss Elizabeth Patterson and grandnephew of the first Napoleon. He was born in Baltimore fifty-four years ago and has lived there all his life, where he has pursued a legal profession successfully. He was graduated from Harvard college in 1871 and of the Harvard law school three years later. He was admitted to the bar of Maryland in 1874 and has since practised his profession in Baltimore. He was married at Newport, R. I. in 1875 to Miss Ellen Channing Day of Boston. Mr. Bonaparte has long been prominent in public life and has been closely identified with the civil service reform movement for the past twenty years.

Mr. Bonaparte's father was never naturalized as an American citizen because such an act would have interfered with his aspirations of recognition as a member of the French imperial family. He had two sons, Jerome Napoleon and Charles Joseph. The elder, Jerome, who was born in Baltimore in 1832, had a decided military bent, serving first in the United States army and later in the French army. He displayed great bravery at Balaklava and Inkerman and at the siege of Sebastopol he won the Crimean medal. He fought in the courts of France for his right to a place in the imperial line but while the French government allowed him the title of Prince Napoleon it attached no privileges to it. He died in 1893. Charles J. Bonaparte has never sought recognition from the French government as a descendent of the house of Bonaparte.

CONDITION OF STEAMBOAT INSPECTION SERVICE

Secretary Metcalf last week gave out a summary of the work accomplished by the six retired naval officers who were appointed to investigate steamboat conditions after the disaster to the General Slocum. Several important ports, including all those on the North Atlantic coast, were exempted from the inspection, because it is desired to investigate them when the excursion season is on. The ports were all inspected after the Slocum disaster, but the reinspection by those naval officers, all but one of whom are rear admirals, disclosed a number of new defects. The report discloses two facts of interest. One is that, despite the lesson given in the Slocum disaster and although the service is notably improved since that terrible warning, the very defects that caused that calamity are present in the steamboats of nearly all the more important ports. Another is that conditions are worse along the Atlantic coast, the scene of the disaster. In the west conditions are

good, except in some of the great cities. Chicago and Milwaukee have profited as little by the Slocum lesson as has the Atlantic coast.

The finding in the case of Milwaukee is especially significant. After reporting the want of proper life preservers on the vessels there, Admiral Field says that the fault is not with the inspectors but with the system. It has never been the custom to compel steamboat captains there to have proper life preservers and the inspectors were afraid to initiate the custom after the Slocum disaster for fear the captains would go to other ports for their annual inspection and thus reduce the number of vessels receiving certificates at Milwaukee, which would in turn reduce the pay of the inspectors. Then comes this statement:

"Moreover, they were afraid that such action on their part would antagonize powerful interests and jeopardize their positions. These conditions tend to make the inspectors easy in their inspection and weak in their demands, and the result is the service is regarded as something to be run with as little inconvenience as possible."

Chicago is similarly criticised, although the larger vessels there are in good condition. Inefficient fire drills and improper carriage of lifeboats are the principal trouble there. At St. Louis Admiral Bartlett could find only one defect, which was that one vessel had some lifeboats smaller than is required by law. There were only slight defects at Memphis, while Louisville and Nashville were reported as satisfactory, Port Huron fair and Detroit excellent.

In the east about the only place which comes in for favorable comment is Burlington, Vt., where conditions are said to be satisfactory.

The worst offender seems to be New Orleans. Admiral Wise describes conditions there as "very bad." Defective life preservers, the improper carriage of boats, the absence of fire drills, defective fire hose and about every element that entered into the Slocum disaster, with several added features, are the characteristics of steamboat traffic there.

Mobile is "decidedly bad." Admiral Wise says: "She has pretty much the same record as New Orleans, with the addition of 'dangerously inflammable lamp and paint rooms.'"

Commander Tanner, who investigated the South Atlantic coast, says the defects he found are chargeable not to the inspectors but rather to the custom and regulations under which they work. In Norfolk, Baltimore, Savannah and Jacksonville he found defective life preservers and fire hose.

In Norfolk nineteen out of twenty-six life preservers on one boat were condemned. At Baltimore, in testing the fire hose on one steamer, 50 per cent burst and on another 15 per cent, while five had couplings blown off. He found unprotected paint lockers and lamprooms in nearly all these cities. He however reports conditions in Norfolk and Baltimore as satisfactory, and in Savannah and Jacksonville unsatisfactory.

The only New York port inspected was Oswego, where Admiral Symonds reported the conditions as "exceedingly bad." Out of three vessels there all had defective life preservers; one had life preservers inaccessibly stowed; one had defective life boats and one defective hose. Four other vessels were fairly good. Admiral Symonds speaks of "inefficient conditions and lack of compliance with the laws," and ascribes it to the "slack and careless manner" in which past inspections have been conducted.

Messrs. Vickers Sons & Maxim of Barrow have received an order from the Japanese government to build for them a battleship of about 19,000 tons displacement, and 475 ft. long. The Peruvian government has also placed an order with the same firm for a third class cruiser.

SIX MONTHS' SHIP BUILDING

The Bureau of Navigation reports 1,054 sail and steam vessels of 263,064 gross tons built in the United States and officially numbered during the year ended June 30, 1905, as follows:

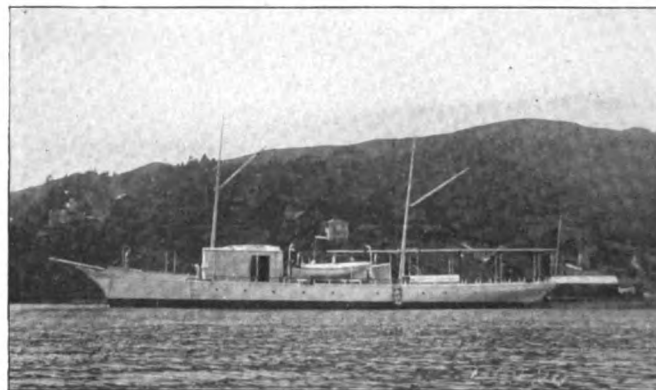
	Wood.				Steel.				Total.	
	Sail.		Steam.		Sail.		Steam.		No.	Gross.
	No.	Gross.	No.	Gross.	No.	Gross.	No.	Gross.		
Atlantic and Gulf...	317	68,962	287	11,890	3	1,773	42	56,777	649	139,402
Porto Rico...	5	47							5	47
Pacific...	23	3,530	122	10,688					145	14,218
Hawaii...										
Great Lakes...	14	191	42	862			29	102,497	85	103,550
Western Rivers...			168	5,766			2	81	170	5,847
Total	359	72,730	619	29,206	3	1,773	73	159,355	1054	263,064

During the corresponding year ended June 30, 1904, 1,092 sail and steam vessels of 349,573 gross tons were built in the United States and officially numbered, as follows:

	Wood.				Steel.				Total.	
	Sail.		Steam.		Sail.		Steam.		No.	Gross.
	No.	Gross.	No.	Gross.	No.	Gross.	No.	Gross.		
Atlantic & Gulf...	318	47,868	282	14,795	5	15,374	47	97,981	652	176,018
Porto Rico...	7	129							7	129
Pacific...	30	7,036	116	13,949			4	1,211	150	22,196
Hawaii...			1	8					1	8
Great Lakes...	4	144	48	1,260			41	139,898	93	141,302
Western Rivers...			188	9,879			1	41	189	9,920
Total	359	55,177	435	39,891	5	15,374	93	289,131	1092	349,573

GASOLINE YACHT LUCERO

The gasoline yacht Lucero has been brought back to the bay of San Francisco by her new owner, Capt. Harry Goodall, the San Francisco ship owner. She was built some years ago on Puget Sound for the late Charles L. Fair, who was killed in an automobile accident in France. She is 100 ft. long, 16



GASOLINE YACHT LUCERO.

ft. 6 in. broad and 7 ft. deep. Her engine had four cylinders and developed 110 H. P. In 1902 she was sold to the Pacific Packing Co., the price paid being reported as \$15,000. After being refitted, she plied as a despatch boat between Seattle and the company's canneries in Alaska. Old mariners made a good deal of fun of the Lucero when she was built, saying that, when she had a full supply of gasoline on board, there would be little room for anything else; but she proved herself a fast and able boat.

John G. Kreer, formerly of the firm of Kreer & Parsons, ship engineers and builders, Chicago, has sold out his interests in the company to Mr. Parsons to accept a position with the Chicago office of the Gas Engine Power Co. and Chas. L. Seabury & Co., as salesman.

The Improvement of the Ohio River

After a lapse of thirty years, it was on the third of March, 1875, that Congress made the first appropriation toward providing the Ohio river with a continuous 6-ft. channel by means of locks and dams, and before any tangible results have been accomplished, Congress considered it advisable to change the plan of canalization, and instead of a 6-ft. to provide for 9-ft. channel, at least for 23 miles of its length. The river and harbor act of March 3, 1905, contains the following provision for a 9-ft. channel:

Improving Ohio river in the state of Pennsylvania: By the completion of locks and dams numbered two, three, four and five, and the modification of said locks and dams and of lock and dam numbered six, so as to secure a stage of nine feet in the pools belonging thereto.

Whether or not this was a commendable step is a matter which time alone can decide; but from a business point of view—that is, considering the present state of the works constructing to provide for a 6-ft. navigation, and the interests specially benefited by the increased depth—in which the country at large is concerned, it has the earmarks of rashness. This conclusion is strengthened by the following provision contained in the same act:

The secretary of war is hereby authorized and directed to appoint a board of engineers to examine the Ohio river, and report at the earliest date by which a thorough examination can be made, the necessary data with reference to the canalization of the river, and the approximate location and number of locks and dams in such river, with a view both to a depth of six feet and nine feet; and in said report shall include the probable cost of such improvement with each of the depths named, the probable cost of maintenance, and the present and prospective commerce of said river, upstream as well as downstream, having regard to both local and through traffic. They shall also report whether, in their opinion, such improvement should be made, and whether other plans of improvement could be devised under which the probable demands for traffic, present and prospective, could be provided for without additional locks and dams, or with a less number than is described in surveys heretofore made, giving general details relating to all of said plans and the approximate cost of completion thereof.

This shows beyond question that congress had not the information necessary for intelligent action in the matter. Undoubtedly congress' indorsement of the 9-ft. channel for the 23 miles of river within Pennsylvania was based on the report dated Aug. 10, 1903, of a board of engineers, in which it is stated that to meet the evident demands that will be made by the manufacturing plants on the Ohio river within the Pittsburgh district, that a depth of 9 ft. should be provided from Davis Island to Lock No. 7. The report contains also the following:

The present plan for improving the Ohio river contemplates a navigable depth of 6 feet at pool stage, which depth is insufficient by 2½ feet for the system of boats now in use on the river in the transportation of freight to New Orleans. The pools below dam No. 1 on the Ohio river will therefore be useless for harbor purposes for the craft now in use, and if increased harborage in the vicinity of Pittsburgh is sought down the Ohio river it can only be obtained in two ways: Boats must either be so changed as to draw only 6 feet, or the system of locks and dams be so changed as to accommodate at least the present boats.

After consulting the larger shippers of coal from Pittsburgh to New Orleans, the conclusion is reached that towing by the wholesale from Pittsburgh to New Orleans can be done at a profit on 6-foot draught at a cost of 75 cents per ton of freight towed and at a cost of 54 cents per ton on a 9-foot draught. This, however, would not form a proper basis for comparing this system of transportation with any other. It does not include the cost of the return of barges to Pittsburgh or the cost of the cheaply constructed coal boat that is often not returned. Charging to transportation the cost of the coal boat and assuming that it goes with the cargo, the cost of transporting coal to New Orleans on a 6-ft. draught is \$1.67½ per ton, and on a 9-ft. draught \$1.35½. The net saving, therefore, to the transporter of coal on a 9-ft. draught instead of on a 6-ft. draught is, under any circumstances, 32½ cents per ton on freight from Pittsburgh to New Orleans.

It is confidently believed by the board that the saving on higher grades of freight shipped in boats that will be returned will be at least

as much and probably more than that stated above. There were shipped from Pittsburgh south during the last fiscal year via the Ohio river 4,616,227 tons. With a depth of 9 ft. in the Ohio and Mississippi rivers, and with the Isthmian canal completed, it is thought to be safe to assume that the above saving will be effected on at least 10,000,000 tons of freight a year. A saving of 32½ cents per ton in the transportation of the above amount of freight would be \$3,250,000 per annum, which if capitalized at 3 percent would be \$108,333,333.33.

Some of these statements are subject to question. Why a greater depth for 23 miles than for the entire length of the river? Should the original project for a 6-ft. channel, which is now under way, be carried to completion, there will be no necessity for harborage in the Pittsburgh district. The object of the project for a 6-ft. channel is the providing of a sufficient depth of water by means of locks and dams to permit boats of not exceeding 6-ft. draught to navigate without interruption, except when the river is closed by ice, etc. The late Col. William E. Merrill, who gave the canalization of the Ohio much study and who built its first lock and dam, stated in his report of June 30, 1876, on the opposition of the coal shippers to the construction of the lock and dam at Davis Island (known as Dam No. 1), as follows:

The truth is that if the Ohio river were provided with a perpetual 6-ft. navigation there would be no need for the huge fleets that can only run during a few months in the year, and at other times are tied to the banks. The traffic in coal would become regular and constant.

* * * but I recognize the fact that the shipment of coal is not the only nor even the chief commerce on the Ohio river; that, however valuable in its effect on other industries, the total annual value of the coal that descends the Ohio is but \$6,000,000, as compared with a general river-commerce of about \$200,000,000.

The harboring of coal and other freight in barges or boats is costly. Take coal, the boats must be pumped almost daily, which requires a force of men; then there is the natural decay of the boats while not in transit. The present method in use by coal shippers, and referred to by Col. Merrill, is the harboring of coal at Pittsburgh until a favorable stage of water and then shipping it down river. In the past, coal has been held in the Pittsburgh harbor for over four months before shipment was possible.

As coal forms so small a percentage of the value of the freight handled, should the coal interests receive so much consideration as to allow them to dictate the manner of improvement? In this connection it may be pertinent to ask who will receive the increased benefits which may be derived from a 9-ft. over a 6-ft. channel? Considering coal, which is the main item of freight put forward by those clamoring for a 9-ft. channel, during the year 1904 coal in barges sold at Pittsburgh for \$1.25 per ton; at Cincinnati the average price for coal in barges was \$2.12½ per ton. Does not 87½ cents a ton appear rather high for transportation, especially when it can be transported to New Orleans in boats drawing 6 ft. at \$1.67½ per ton—New Orleans is fully 1,436 miles further from place of shipment. There are no tolls charged.

Undoubtedly the amount of freight in and out of Pittsburgh is enormous, but cannot that portion of this vast amount which will deflect to the river after its improvement is completed, be handled on a 6-ft. channel? Again considering coal, the locks thus far completed, which are among the largest in use in this country, are designed to pass a towboat with ten barges and two flats at one locking. Such a fleet will carry fully 140,000 bushels of coal; allowing two months in each year for suspension of navigation, from one cause or another, the sending of one fleet each day would amount to at least 42,000,000 bushels in a year. To transport 10,000,000 tons, referred to as the probable yearly amount of freight from Pittsburgh, would

only require the sending out of six fleets instead of one each day.

The matter of "the system of boats now in use on the river in the transportation of freight to New Orleans" deserves but little consideration. As the Ohio is a public waterway and as no revenue is derived therefrom, it would be more to the purpose for steamboat owners to build their boats so as to conform to the river conditions, than that the government should expend large sums to so improve the river as to accommodate certain boats. Should reasonably continuous navigation be established on the Ohio, boats will, no doubt, be designed to meet all requirements.

These are matters that the board appointed by the Secretary of War must consider; and should it decide that indications, both present and future, point to the adoption of a 6-ft. channel, of what advantage will be the 9-ft. channel in the 23 miles of river? Will not the continual movement of 6-ft. draught boats, without harborage, be more economical than the periodical movement of 9-ft. draught boats with harborage? Will not as great a number of people be benefited by the 6-ft. channel as by a 9-ft.? The importance of an improvement, when undertaken by the general government, should be gauged by the number of people benefited. There is no doubt of the advantages of a 9-ft. channel, but will the needs justify the cost?

Congresses in the past have been providing for a 6-ft. channel for the Ohio river from Pittsburg to below Cincinnati, a distance of over 470 miles, the accomplishment of which will require thirty-seven locks and dams, the minimum cost of each of which will be \$1,000,000. With this end in view, structures are building at or near the following localities: Coraopolis, Sewickly, Glenosborne, and Rochester, Pennsylvania; Wellsville, Brilliant, Marietta, and Cincinnati, Ohio; and McMechen, West Virginia. A lock and dam has been completed and is in operation at West Bellevue, Pa., and another practically completed and in operation near Beaver, Pa. To June 30, 1904, \$5,749,600 has been appropriated toward providing a six-foot channel (exclusive of Dam No. 1); of this amount \$3,175,448.34 has been expended, with the result of only one structure, that known as Dam No. 6, in operation. This lock and dam was formally opened to navigation in October of last year, the first appropriation for the work having been made in September of 1890. Work on the lock and dam at West Bellevue was begun on August 19, 1878, and opened to navigation on October 7, 1885, at a cost of over \$910,000.

Much of the present delay in completing the proposed structures is due to congress. Instead of following the recommendations of the officers in charge of the works, that sufficient funds be appropriated to permit of contracting for all the structures required at a locality, congress continues to provide inadequate amounts for carrying on the works at several localities, with the results that the progress is most unsatisfactory, that the cost is unnecessarily increased, and that the officers are unjustly criticised.

Whatever the form of improvement adopted, the board should strongly recommend the appropriation of adequate funds to promptly and properly put the work in course of completion. With all the funds so far expended toward the canalization of the Ohio, navigation has received but little, if any, benefit.

Six-foot navigation has been very successful on the Kanawha river, a tributary to the Ohio. During the year 1904, 1,094,700 tons of coal was transported, and that with a channel of only 100 ft. in width when the dams were up. This amount will, no doubt, be greatly increased when the Ohio is canalized below Point Pleasant, W. Va. With the exception of the Monongahela, which has a channel depth of from 4 to 8 ft.,

the navigable depth of the improved tributaries to the Ohio is not over 6 ft.

The problems which will confront the board are such as will require much thought and study. The engineering features have received considerable attention in the past, therefore the principal matter for consideration will be the necessity for and the kind of improvement and its cost.

It is not only the first cost of the improvement which must be considered, but also the cost of maintenance; and the cost of maintenance is a most important factor. To maintain a 9-ft. channel will undoubtedly require the removal of large quantities of deposit each year, as the water in the Ohio carries an unusual amount of sediment after heavy rains. Not only the sediment carried by the water, but there are numerous small streams (runs and creeks) which carry into the Ohio enormous amounts of material—it is known that Wheeling creek has put out enough material after a severe rainstorm to form a bar which practically interrupted navigation. Dredging on this river has thus far proved very costly. Since the completion of Dam No. 1, in 1885, to June 30, 1904, it has cost \$360,836.21 to operate and maintain—this amount does not include any expense for dredging—or practically \$19,000 annually for a period of twenty years. At this rate the cost of operating and caring for thirty-seven locks and dams, which the present project contemplates as necessary to provide for 6-ft. navigation over a distance of 470 miles, would amount to over \$700,000 annually, exclusive of dredging. To maintain a 9-ft. channel from Pittsburg to Cincinnati would require at least two well-equipped dredging fleets, the operation of which would cost fully \$100,000 each year. And this is for not quite one-half of the length of the river. While it is the most troublesome section, the maintaining of similar improvements on the lower section will add greatly to the total cost of maintenance.

SITUATION AT BUFFALO

Buffalo, July 11.—The firing up last week of the second blast furnace of the Buffalo & Susquehanna Iron Co. adds quite materially to the iron-producing capacity of this port, though such an addition might not be noticed by some of our western rivals. Still when it is remembered that at no very distant date practically no iron at all was turned out here the production is very significant, especially as the limit has by no means been reached. Speaking by district, as well as by ownership, Buffalo is already an ambitious ore-consuming center and it appears that the shipment through here to eastern furnaces is to increase very rapidly.

All eyes are on the Pennsylvania Railroad, which is not only actively engaged in building what promises to be the largest, or at least one of the largest ore-shipping docks here, but is rapidly acquiring land in the vicinity of these docks. Some of this property is no doubt to be used for land terminals, but it is practically all close down to the level of Lake Erie, so that canal extensions ought to be the natural use for the property and it is already reported that the company will build canals on its new property.

It is also said, though unofficially, that the Pennsylvania will discontinue its ore docks at Erie when the handling can be done here, so that Buffalo is likely to be the iron center of that company on the lakes in a short time. It is noted that the Pennsylvania is apparently making all effort to come up neck and neck with the New York Central in ownership of property here and in commanding importance, though so far the New York Central has pretty nearly owned Buffalo, being the only road with a line all round the city, which it uses with imperial hand, commanding the route to Niagara Falls and Canada and doling out privileges to other roads in a way that merely permits them to edge into the city from that direction.

But to the ore industry of the port proper. The oldest furnaces are those of the Buffalo Union Furnace Co., on Buf-

falo Creek at the head of present deep navigation. This is a rebuild of the old Union Iron Works, which was for a long time idle, and has an ore-reducing capacity of 650 tons of pig iron a day. It also manufactures the finer grades of iron extensively.

The two furnaces at North Tonawanda are owned and managed here by Rogers, Brown & Co. and have a capacity of 475 tons of iron a day. This firm rebuilt one of these furnaces in 1890, the other being blown in by McKinley on a visit here during his first presidential campaign. The plant had been built in 1874 by Buffalo iron manufacturers, but had been idle a long time before the present owners took hold of it.

Rogers, Brown & Co. also built a furnace at Punxsutawney, Pa., several years ago, where they turn out 225 tons of iron daily. It was noted that the Buffalo, Rochester & Pittsburg Railroad had ore docks in the harbor and that it was running coal in here constantly, but always sending its coal trains back to its mines in the vicinity of Punxsutawney light, so a low return rate on ore was obtained and the iron was turned out where coal was handy and was partly on its way to the eastern consumer.

Of course the big ore consumer is the Lackawanna Steel Co. at what is known as the steel plant on the lake shore just over the city line. Here there are two furnaces, or stacks as the professional calls them, of 300 tons of iron capacity each and four of 500 tons each, a total of 2,600 tons, which is said to be a rather high estimate. This plant is a great manufacturing town enclosed by a high fence and maintaining a community of its own, with a railroad to the city. Unlimited additional capacity is possible there.

The latest addition to the group is that of the Buffalo & Susquehanna Iron Co. at the city terminus of the railroad of that name, but controlled, it is said, by Rogers, Brown & Co. This is alongside the steel plant, with the unfinished Pennsylvania Railroad dock on the opposite side of the special ship canal and is mostly inside the city. The two furnaces have a capacity of 350 tons each, the older one having exceeded this amount lately.

This gives a total pig iron capacity of 4,550 tons daily and requires a matter of 7,600 tons of ore a day, not to mention the considerable amounts shipped eastward over the docks of the New York Central, Pennsylvania, Lehigh Valley, Erie and Minnesota companies. Ore handling is in very good hands and no complaints are heard. Of course nobody promises to take out the Wolvin in four and a half hours, as is reported to have been done lately at Conneaut, but even the latest finished dock is receiving congratulations in regard to despatch.

JOHN CHAMBERLIN.

PROMPTITUDE OF TURBINE ACTION

The promptness with which a turbine can be put into action was the subject of a paper read at the June meeting of the American Society of Mechanical Engineers. During the discussion mention was made of the celerity exhibited in taking the steamship *Kaiser Wilhelm der Grosse* from her moorings at the Hoboken, N. J., pier of the North German Lloyd Steamship Co. at the time of the great fire on June 30, 1900. Further facts have been obtained from the North German Lloyd Steamship Co.'s superintendent at the Bremen piers. The communication throws some light on the occurrences of a strenuous day for the engineers and others most concerned with the safety of this huge vessel and the record is here given space as follows:

"The supposition, that the *Kaiser Wilhelm der Grosse* was taken from the pier by her own steam power is not in accordance with the real facts in this case. When the fire broke out (about 3:40 p. m. on Saturday, June 30, 1900), the steamer had no steam up excepting on one boiler, which furnished only sufficient steam for the deck winches, pumps, dynamos for the electrical plant, etc. All the other boilers

were being cleaned and put in shape again for the next trip. The engines were partly disjointed and several cylinders had their covers removed. This cleaning and overhauling is done every time when the steamer is in port.

"That we were able to get the steamer clear away from the fire, which spread with such formidable rapidity, was due in the first place to the lucky circumstance, that we were about to shift the steamer close to her pier. The steamer had just finished taking aboard the coal needed for her return trip to Bremen. The coal boats, which had been lying on each side of the steamer, were being removed. The steamer was about 35 ft. off the pier and was being hauled close to the pier. She was, therefore, in motion when the fire broke out, which was of the greatest assistance in pulling her out, as the deck winches were using every pound of steam to pull on the hawsers, which had been carried to the end of the pier.

"Immediately after the fire broke out a number of tugboats steamed up to render assistance and I ordered the first ones to pull out the *Kaiser Wilhelm der Grosse*, she being the most valuable of the four steamers, lying at our piers at the time. The tugboats succeeded in pulling the steamer out of the burning slips to a safe anchorage with comparatively little damage to the big vessel.

"As soon as the steamer was out of reach of the fire our engineers worked hard as they could to put the engines in shape again and to get steam up. As a rule it takes about 11 hours to get up sufficient steam to drive the propellers, but in this case every effort was made to get steam up as quickly as possible. This was done, to the best of my recollection, in about 7½ hours and it was about 11:30 p. m. that night, when the steamer was able to use her own propellers and was, therefore, independent of outside assistance, although at that time she was riding safely at anchor."

FOUNDER OF THE JAPANESE NAVY

Editor *Marine Review*: The article in the issue of June 29 under the above caption brings to my mind a yarn my father used to spin to me when I was a small kid. About 1840 he was owner and commander of a two-masted schooner, the *Warlock*. She had previously been a slaver but was captured by the British, condemned and sold. My father bought her in London and sailed to the orient—with a suitable cargo—where he remained, trading from Hong Kong to the Sandwich Islands and Australia.

One voyage shortly after leaving Hong Kong for Honolulu with a cargo of Chinese goods he ran into a typhoon and was blown out of his course and dismayed.

When the weather eased and he was able to take an observation he found he was near Japan. After rigging a juremast he made for the nearest port and casting anchor in the offing sent a boat ashore.

The boat was intercepted by one from the shore which accompanied it back to the *Warlock*.

At that time the only European country having a treaty with Japan was Holland. My father was a good linguist and spoke Dutch as well as he did his mother tongue—English. The Japs in the boat were all in chain armor and were armed with swords and pikes. Their head man asked my father what he wanted. "New spars throughout, some fresh water and provisions." "All right," said the Jap. "Make out a requisition in Dutch and let me have it but don't send any boats ashore."

My father gave him a list of what he wanted together with the sizes of the spars.

A few days later the spars were sent alongside with laborers to help step the new masts. A full supply of fresh provisions and water—more than ordered—was sent on board.

After the masts were stepped, the standing rigging set up, and the running rigging rove, my father asked the head man how much he owed. "Nothing at all," said the Jap, "but if you wish to keep your head on your shoulders don't come back here again."

E. A. SUVERKROP.



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Second Class Matter.

JULY 13, 1905.

Another million of dollars in ship building contracts placed by the government in foreign ship yards deserves more than a mention. The self same government which exacts that we as individuals shall not commit the crime of purchasing ships abroad to operate in our home waters, should at least be an example of nautical probity in this respect. That this governmental indiscretion was committed three years ago, does not lessen its value as a strange object lesson to a patriotic people, nor, now that the details are beginning to be published openly does it exactly inspire a respect for the reasons or methods by which it was brought about. The details of this transaction are to be found in the last issue of the Review.

Americans who are earnestly in favor of the uplifting of our merchant marine, which has well-nigh disappeared from the ocean trade routes, desire not only to see wholesome measures adopted for its rehabilitation, but at the same time desire to see exact and honorable application made of all present regulations and laws. New laws for the new shipping may work wonders—but until these new laws are provided, should not the maritime interests and investments have

the full benefit of the old laws? And should the government be allowed to be the first transgressor of these old laws?

This journal had misgivings as to the nature of or the amount involved in the ship contracts let by the insular administration of the Philippines for the Bureau of Coast Guard and Transportation, and has gone to some pains to acquire an official statement of facts. In another column will be found extracts from the reports of the Philippine Commission, which will dispel any illusion that our shipbuilders may have had that the insular bureau had contracted for a few paltry revenue launches for a hurry delivery.

Perhaps an American firm was invited to tender for these ships, but a single firm is not representative, and it is known that the intention to purchase these vessels was not a matter of general information among the great or small shipbuilders of our country. Also it is equally well known, that any American firm tenderings bids would have presented figures which were bona fide, for ships built to close specifications, and in all respects to comply with the high requirements set by our navy and revenue marine. No American firm in wildest flight of imagination would have for a moment considered the possibility for offering for government acceptance—"vessels, all of which were down by the head"—"decks of unsuitable material—knotty"—"copper sheathing of all defective" (some came off on the way to Manila)—"electric lighting and auxiliary machinery of all defective."

Lest there may be no misunderstanding—let it be thoroughly known that the American ship builder estimates only on the highest class of work for government acceptance—for he knows that no other will suffice—the American people demand the best. Our cruisers, our battleships, our revenue cutters are concededly the best. With ships, as with other commodities, the very best cannot be the cheapest.

If the Philippine commission wanted second class vessels, they should have so stated to the American ship builder. Whether they wanted second class vessels or not—that is what they received—some of them even third class—while a few would not rate even tenth class, and were so wretchedly bad, perhaps even dangerous, that the commission refused to have them even as a gift. Just here consider the pitiable plight—a branch of the United States government actually presided over by wide-awake Americans, being obliged to tell the sharp Japanese contractor—"keep your miserable ships and the money we have already paid on account." Then with an effort to change their luck the commissioners ordered the Chinamen to have a chance at building an equal number to what had been thrown back upon the Japanese—on the plan that as the Chinese boats already built had not been so very bad (they would float although "down by the head") consequently the Chinese could best fulfill the order.

On the arrival of these vessels it was at once evident that a repair yard would be an immediate necessity—so an island in Manila Bay was set apart as the official navy yard of the Bureau of Coast Guard and Transportation. This yard is now in commission, and probably very busy with the repairs and upkeep of this defective fleet.

In war times the government is perhaps justified in purchasing ships from any nation, but no one can concede that these Philippine purchases were "war time purchases." The war had long since been terminated; the troubles with the insurrectos were over and the official civil government had been promulgated and was in working order. These ship purchases were by order of this civil government.

While we have condemned the method of purchase of these vessels, yet all must concede a large amount of congratulation to the commissioners who could see the administrative need for this unique fleet of small vessels. In a country devoid of railways, it was almost equivalent to the supply of complete rail communication to outlying points. For in these islands, rail routes can never attain a strong hold, and steamers will ever carry the bulk of the trade. This insular navy is a fleet for most miscellaneous government duties—serving as a fighting or transport navy for the insular constabulary; a revenue cutter service for the insular treasury; a lighthouse tender service for the island lights, and yet doing large amounts of work as mercantile transports, until such time as private enterprise sees its way clear to the inauguration of commercial steamers.

FREIGHT SITUATION

Unusual efforts were made last week at Lake Erie ports by vessels to escape the effect of the double holiday. Overtime was paid to get them out before work ceased on the fourth of July with the result that a constant stream of vessels went up the lakes on that day light. This under normal conditions would make the vessels arrive at upper lake ports a little more freely than they could be cared for, but other circumstances have also contributed to bunch them. The heavy rains have flooded some of the open pit mines and ore is not moving forward to shipping docks at its customary rate. There has also been a scarcity of railway equipment and an accident on the Duluth & Iron Range railway and it will be several days before a number of vessels will be loaded. Fogs, too, have contributed to make navigation somewhat slow and difficult.

There is no change in the market as far as coal and ore rates are concerned, but the grain rate has sagged. Coal has not been moving forward freely at any time during the season and the total shipments to date are considerably less than they were last year.

LAKE FREIGHTERS MAY CARRY GUESTS

The Department of Commerce and Labor has approved a number of important changes in the steamboat inspection rules which were formulated by the executive committee of the Board of Supervising Inspectors in session at Washington. The most important of these amendments is the one classifying passenger boats as those which carry passengers for hire. Under the new rules the freight boats of the great lakes which carry an occasional guest were regarded as coming under the

provisions relating to passenger boats with all the regulations that these rules provide for life saving and other equipment. Under the change the freight steamers of the great lakes that have a passenger license may carry guests as they did in former years. A passenger steamer is distinctly defined as a vessel that carries passengers for hire, the freight boats of the great lakes carrying passengers by invitation only.

CHICAGO GRAIN REPORT

Chicago, July 11.—The aggregate grain shipping of the past week has been slightly upward of 3,000,000 bu. The movement fell short of current vessel offerings and rates thereby eased off gradually to 1 cent to 1½ cent per bu. on corn Buffalo and Georgian Bay. All water carriers going at 4 cents corn free on board Montreal ocean steamer.

The general situation affects the lake carrier most peculiarly for unquestionably the newly established freighting basis reflects little of the prosperous status in the salable quality of farm products generally—especially in corn. The excess total movement from Jan. 1, 1905, as against the previous year is grounded largely by reason of the active eastern railway-gulf competition during the past winter. Admittedly, there is a normal reservation of grain at primary quarters but the holders evidently indifferent to this time toward its marketing. In round figures 50 cents per bushel of corn is now bid at country stations contiguous with Omaha, and bids at Chicago figuring about 57¼ cents to 57½ cents per bushel. The New England market nominally at 65 cents per bushel, which represents practically the difference in freighting and Liverpool July corn quotable at about 68 cents per bushel. Prices thus inclined in general harmony it would seem that shortly conditions must develop a grain movement which will accrue much more satisfactorily in general to the carriers' benefit.

The disbursement of total shipments during past week notes as follows: Via all rail lines of wheat 55,000 bu., corn 327,000 bu., oats 650,000 bu. Via lake steamers to Buffalo and other American ports of wheat 50,000 bu., corn 1,679,000 bu. and oats 14,000 bu.; and to Canada points via lake of corn 272,000 bu. and oats 985,000 bu.

Lake and rail shipments:

	This week.	Last week.	Same week last year.
Wheat	104,677	243,609	216,258
Corn	2,279,654	2,070,247	1,966,802
Oats	619,464	851,504	744,585
Rye	2,260	9,200	7,243
Barley	22,022	19,142	30,200
	3,028,077	4,093,702	2,965,088

Lake and rail shipments:

		Same time last year.
Wheat	6,667,733	6,974,384
Corn	46,633,788	32,036,794
Oats	25,923,056	24,358,940
Rye	595,912	789,210
Barley	2,324,279	2,634,228
	82,144,768	66,790,556

Stocks in private and public elevators:

	This week.	Last week.	Same week last year.
Wheat	1,093,000	1,280,000	2,285,000
Corn	5,403,000	4,168,000	5,345,000
Oats	3,224,000	2,970,000	1,000,000
Rye	70,000	88,000	400,000
Barley	10,714	15,714	212,000
	9,809,714	8,530,714	9,398,000

The Boston Towboat Co., Boston, Mass., has awarded contract to the Portland Co., Portland, Me., for the construction of a towboat 102 ft. long and 19.6 ft. deep. She will be constructed of wood and equipped with compound engines.

OUR MERCHANT MARINE

By Edward P. North

The following was submitted to the Committee on Merchant Marine with the hope that they would publish it. And although they did not think it available, the writer is led to believe that others will find it of interest:

Mr. J. J. Hill's testimony before your honorable commission in the city of New York, on May 24, is of great interest, coming as it does from a railroad president who has created and built up his own road instead of succeeding to a well-established line. The salient points in his testimony were: Assertion of our superiority as carriers not only on the land but on the great lakes; declaring, in effect, we could not build up a merchant marine without assuring it employment; advising an export bounty, and contending that in case of war we could easily buy all the ships we required.

This last proposition, though delightful to foreign shipbuilders and ship owners, is so astounding as issuing from one of proved business capacity that it seemed necessary to refer to the fact that wars are now as much a matter of finance as of men. And to deplete our resources by costly purchases of foreign shipping preparatory to entering on a contest with a resourceful nation is not more sensible than training a football team by Dr. Sangrado's method of bleeding and hot water. Besides which, it seems from our short experience with Spain, while we can purchase ships, we cannot purchase competent sailors for the ships.

On the other hand, nothing can be much nearer absolute truth than the proposition that assurance of employment is necessary for the development of the American merchant marine. There is a parallelism in the histories of British agriculture and the American merchant marine showing the necessity for continuous and profitable employment which is too often neglected. In the "50's" every one in any way interested in farming looked up to the British superiority in agricultural methods. Books, magazines and newspapers were full of it. At the same time the superiority of Yankee ships as passenger and cargo shippers was undisputed. Now for a long time "The Bitter Cry" of British agriculturists has assailed our ears, and it is painful to make public mention of our maritime interests.

Up to 1847 the British farmer was the most prosperous in the world through the protection afforded him by the "corn laws" against our wheat. Until 1850 the American ship was the best built and best manned ship in the world, because it was protected against British ships by a law preventing them bringing any merchandise to our ports which was not the product of their own country or colonies. Until 1850 British ships could not load a cargo of mixed origin for this country even in British ports; consequently the American ship carried our exports to all foreign ports. Until 1847 the British farmer commanded what is still the best market for agricultural produce in the world—his home market. Protection was withdrawn from both. Now, after two months' war with a maritime power the English poor would be starving, and we must "bleed white" to buy ships of aliens if we have a serious difficulty on hand. Dumping has brought both the British farm and the American ship nearly to a standstill.

Both of them, however, survive. Some time since Mr. Littlewood, at Westbourne, England, gave the British acreage under wheat in 1852, the first year after the repeal of the "corn laws," in which a reliable estimate of that acreage was made, and the acreage in 1902. Comparing these figures with the American tonnage in foreign trade for the years mentioned, we have:

	1852.	1902.	Percent- age left.
British acreage in wheat.....	4,058,000	1,772,000	43.66
American tonnage in foreign trade	1,705,650	873,235	51.19

Though we have suffered less in the disaster, no one who cares for either or both countries can be pleased with the results wrought by the withdrawn protection.

Much has been written pro and con of the advantages of an export bounty. Probably if 500 or more carloads of freight a day from Lake Superior to Puget Sound were offered Mr. Hill they would be accepted, though there might be a preference for freight in the other direction. In either case there would be an active search for return freight, which, in the absence of syndicate control, would reduce freight charges. Any development solely in one direction would be followed by lower freight rates in the other. The fact that the bounty of 5 shillings per quarter given by England in 1688 on the exportation of wheat was followed by a fall in its price only relates to this subject as it shows the effect of increased supply.

It took years to induce the most intelligent of our newspapers to acknowledge we could be better off than England—to admit to their pages any approximation of Mr. Hill's assertion that our railroad and lake freights were the lowest in the world. And now those papers are trying to minimize the fact that the British, with Free-Trade and low wages, have to charge about three times as much for carrying a ton of freight one mile on roads costing on an average \$268,000 per mile as the Americans, with high wages and all the oppression of a tariff framed without advice from Manchester philosophers, do on our roads costing \$70,000 per mile; while their third-class passenger rate is within a fraction of a mill as high as the average passenger rates in this country.

Although comparisons between our lake, river and coasting rates with foreign rates are not so complete and satisfactory as those on land traffic, it is asserted with great confidence that Mr. Hill did not overstate the cheapness of that traffic and no people in the world have their traffic carried by river, lake and coastwise at as low a cost as we. Our railroads, locomotives and cars were built and are maintained under such disadvantages as are claimed to be inherent in a protective tariff. This is true also of the vessels on our coasts, rivers and lakes. And even those who begrudge continuous employment to the American wage-earner cannot pretend that any part of them is sold to foreigners at less cost than to ourselves.

Both our railroads and the shipping mentioned are protected against foreigners. A cut rate may be dumped on Mr. Hill, but it will be done with American implements and with labor that consumes the produce of American farms. Any one who wishes to "butt in" on any of our waterways can do so without waiting to buy the waterways. But he must do it with vessels built in the United States and owned by a citizen or citizens thereof. In this case also neither the labor nor profits will go to foreigners.

Mr. J. Stephen Jeans, the able secretary of the British Iron and Steel Institute, in a note to the British Tariff Commission, says of our superiority in the iron and steel trades:

"The United States has come to the front, not because their principals and administrators were necessarily more competent than our own, but because it had a boundless home market, in which it enjoyed a large measure of protection, and because it appreciated the certainty of rich rewards for effective enterprises."

It is this certainty that protection will secure a remunerative market that has justified and demanded those heavy outlays for improved machinery, at once the admiration and envy of peoples less favored by such liberal, if not profuse, consumers as protection has developed, by the aid of which we have in this country both merchandise and money. There are few parts of the world where finished products are not reduced in cost and raw materials are not sold at a higher price through the stimulus protection has given to our production.

Herein lies the animus of the opposition to an American merchant marine. If our foreign carrying trade should enjoy as large a measure of protection as production and transportation on land, the new vessels we would put into that business would lower all over-sea freights. They would act as our make of 18,009,252 tons of pig iron in the boom of last year did, in keeping steel rails down to \$28 per ton, whereas, during the boom of 1880, when we made but 3,835,191 tons of iron, and our friends on the other side caught us short, the price of steel rails averaged \$67.50 per ton; another of the numerous instances in which the world gets a finished product cheaper through our production, and foreign iron masters do not exact a famine price.

A like result in the production of American ships would be intolerable to the capital vested in foreign ships, foreign production and foreign commerce, for besides lower freight rates it would carry with it an extension of our market to all those ports of small traffic in which the largest percentage of profit is made; ports to which we now have no access. And some \$50,000,000 a year would be distributed to our wage-earners, transportation lines and capitalists in the building of new ships. American machinery and methods would be introduced, and shortly, as fifty years ago, no one would buy a British ship except as they now buy British locomotives—i. e., when the British lend the money to pay for them. Incidental to the reduced freights that would follow increased shipping, low priced products, now unable to bear transportation charges to a market, would be produced and distributed, to be paid for by our finished products.

It is said by our hard siding champions of foreign interests that all who desire the rehabilitation and successful development of American maritime affairs and commerce are actuated by selfish interests. And there are only a few persons in this country, consumers or producers, who would not derive direct pecuniary advantage from such development. On the other hand, none think that the eminent litterateurs and financiers who are engaged in supplying original thought to our best minds are remaining in that business entirely as a sanitary measure. Here it may be pertinent to quote the *Saturday Review's* (London) remark on some of its contemporaries: "We do not blush for the newspapers; not because they are mainly past blushing for; but we recognize they have their living to get."

The injury these newspapers do to American production and trade, and the value they are to foreign production and trade, may be partly estimated by noting in the following table, which is taken from "The Summary of Commerce and Finance for April, 1904," issued by the Department of Commerce and Labor, that we control our avenues of trade with Canada, Mexico, and Santo Domingo; that vessels under our flag carry our products to Central America, Colombia, Cuba, Haiti and Venezuela; while only 2.7 percent of our commerce with Brazil is carried in American bottoms.

	Total im- ports.	Imports from the U. S.	Percentage of imports from U. S.
Argentina	\$99,433,000	\$9,808,529	10.0
Bolivia	5,587,000	76,926	1.4
Brazil	113,288,000	11,155,505	9.9
Canada	224,814,000	123,472,416	54.9
Central America	13,914,000	6,028,271	43.3
Chile	48,336,000	3,752,222	7.8
Colombia	10,605,000	2,923,404	27.3
Cuba	58,826,000	21,769,572	37.0
Ecuador	7,029,000	1,347,850	19.2
Haiti	5,500,000	1,956,343	35.6
Mexico	74,060,000	42,227,786	56.5
Paraguay	2,270,000	14,815	0.1
Peru	21,062,000	2,573,298	12.2
San. Domingo	2,087,000	1,700,371	56.9
Uruguay	24,505,000	1,549,812	6.3
Venezuela	8,560,000	2,736,726	32.0
Philippines	32,972,000	4,038,909	12.2

Brazil, as shown, buys less than 10 percent of her imports from us. We buy over 40 percent of her total exports; \$60,427,521 worth more than we sell to her. It seems that while we buy, others, in defiance of sound economical thought sell, and we have to glut other markets with our produce to settle both our trade balance and the cost of carriage. This commerce as now conducted is what the eminent British economist, David Ricardo, characterized in the House of Commons, February 9, 1847, as "the most profitable part of commerce—namely, the indirect or triangular trade," whereby we enable foreign vessels to load in European ports with finished products, which are sold in Rio for coffee and bills of exchange on London; the coffee is sold here for, preferably, raw materials and more bills of exchange on London. The managers of this traffic have a direct interest in excluding not only goods of American manufacture, but in excluding Americans and all American influences and investments. They do not even draw bills of exchange on American banks, and they see to it that all business correspondence between the two countries is handicapped by an additional trip across the Atlantic. It is also noticeable that all they can control are made to oppose any extension of our railroad system through or into Central America lest our \$6,000,000 sales there should be increased to the \$42,000,000 we sell to Mexico.

At one time our trade with Brazil was not of the present jug-handled kind. Neither the subsidy of £270,000 a year paid to the Royal Mail Steam Packet Co. nor the practice of reducing coffee freights just before the American steamers sailed was successful in driving them off the route. That, it is understood, was accomplished by the joint efforts of two Postmaster-Generals, one Democratic and one Republican.

Our sales to the Philippines, in consideration of the fact that we buy 34.3 percent of their exports, would be developed if we carried over two per cent of our commerce with them. Our influence in the East would be increased and the Filipino uplifted by remunerative employment if inter-island mails were carried only on vessels built in the United States or in those islands, and manned exclusively by Americans and Filipinos. But a continuation of the present policy will not develop American trade, nor will it tend to make the Filipinos any more ready for self-government than the Hindoos.

Now, after five years' occupation of those islands, it is said only one vessel under the American flag is engaged in the inter-island trade. The carrying trade between this country and those islands is free to all flags and we do two percent of it. We buy over one-third of what the Filipinos sell and sell them less than one-eighth of what they buy. We are reproached with oppressing the Filipino trade and threatened both by foreign papers and those in this country controlled by foreigners with a closed door in China therefor.

That part of our press which has its living to get upheld Great Britain's policy in subsidizing the Peninsular & Oriental Steamship Company when Henniker Heaton, M. P., asserted it was receiving £365,000, or \$5,000 a day. They contended it was necessary for her to keep up communication with her great dependency, India. That it was not a subsidy, after all. That it was merely a payment for services rendered. They, however, would denounce with great unanimity any proposition to subsidize a fast mail line between New York and San Francisco touching at our islands in the Pacific as robbing Americans! They are proclaiming the imminent need of larger and broader foreign markets, the absence of which is working great harm to all our industrial interests. No hint that transportation to those markets should be in friendly hands is liable to appear in their columns. On the contrary, they will insist that foreigners continue as at present to distribute our commodities. They know, without evincing repugnance, that Congress is each year giving over \$5,000,000 worth of post office cars to our railroads and paying them

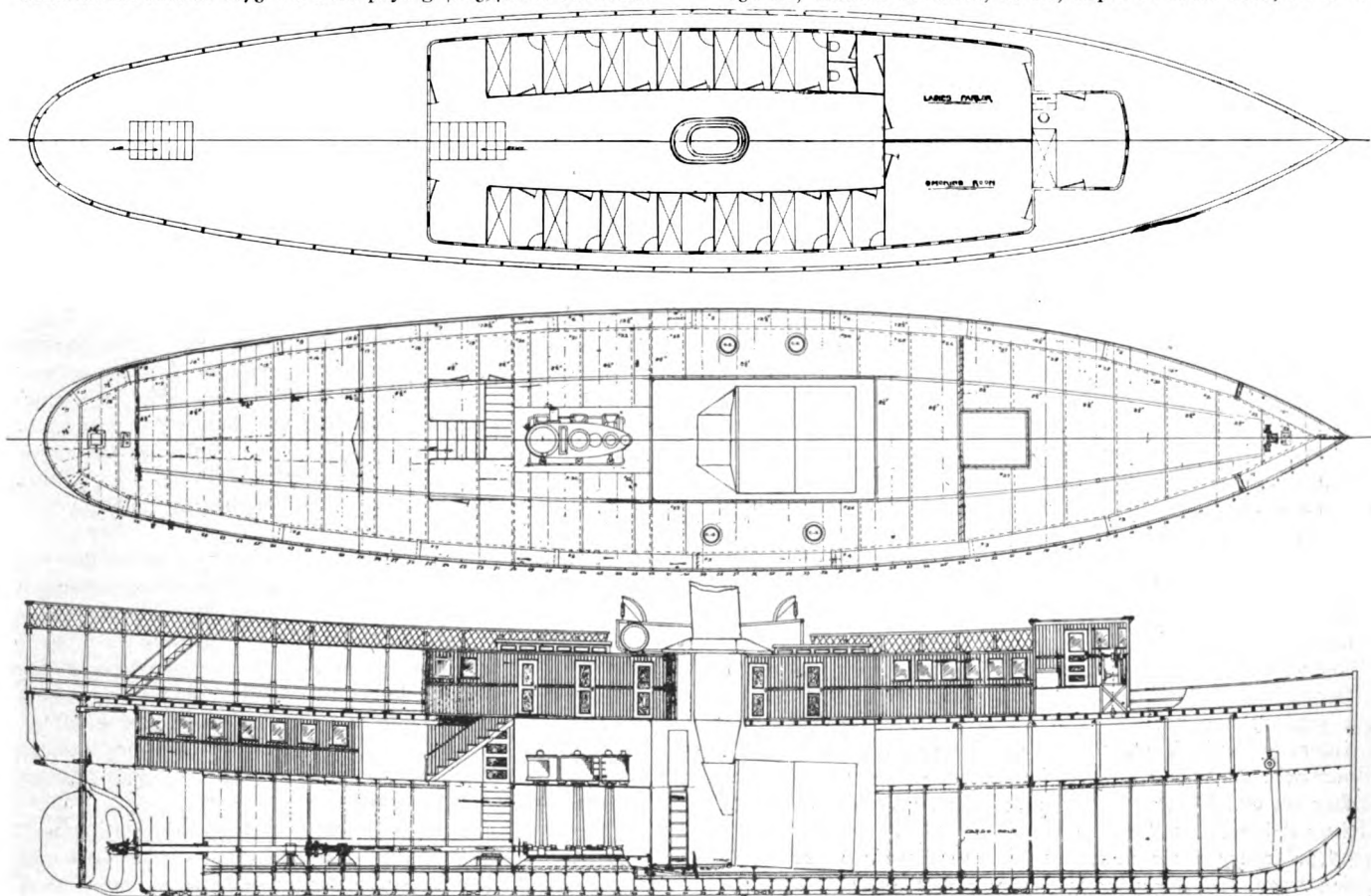
between \$35,000,000 and \$40,000,000 additional for carrying the mails. And a fair proportion of this money goes to roads whose construction was aided by land grants varying from 5 to 40 square miles per mile of road. If any considerable percentage of the above mentioned sum was applied to developing rapid, frequent and punctual communication with and between our non-contiguous islands the result would be an increase of wealth in those islands analagous to that of our own country.

The threat of retaliation has been suggested in connection with this investigation. May I recall to the memory of the commission that in 1873 we were paying \$815,400 to American

from carrying our mails, while encountering renewed competition for freights and passengers, without exhausting all means to have the present arrangement continued.

STEAMER MAYWOOD

The latest addition to the fleet of summer excursion steamers is the steamer Maywood built and designed for the Escanaba & Gladstone Transportation Co. by the Manitowoc Dry Dock Co., Manitowoc, Wis. The general dimensions of the vessel are as follows: Length over all, 142 ft.; length keel, 130 ft.; breadth moulded, 28 ft.; depth to main deck, 10 ft. 6



PROFILE AND DECK PLAN OF THE MAYWOOD.

ships for carrying our mails? In 1880 such payments aggregated only \$38,780. In that time the British subsidies, which for the four years ending with 1873 had averaged \$5,884,324, were reduced to an average of \$3,739,401 for the four years commencing with 1880. That is to say, we saved \$776,620 and presented the tax payers of Great Britain a yearly saving of \$2,144,923, with control of freightage to our foreign markets. In the eight years ending with 1857 we paid nothing to foreign vessels for carrying our mails and our ships carried slightly over 72 per cent. of our foreign commerce. In 1873 we paid foreigners 21.9 per cent. of our total payments for oversea mails and carried 25.8 per cent. of our commerce. In 1880, 80.6 per cent. of our payments for oversea mails went to vessels under foreign flags, and we carried 19.4 per cent. of our commerce.

As the beneficiaries of this unprecedented kindness have not either expressed sorrow for the injury it has done our commerce, nor even acknowledged any sense of having received sustenance from us, it does not appear that they should object to our return to the practices of fifty years ago. But the necessity for increased subsidies will occasion keen regret, and the owners of foreign shipping will not give up their receipts

in.; depth to cabin deck, 17 ft. 6 in. The vessel is built of steel with three watertight bulkheads up to the main deck. The construction above the main deck is of wood. On the main deck forward and in the forward hold is the freight space and the rest of the steamer is arranged for passenger service. The boiler space in the main deck is devoted to the dining room with the exception of a small space aft for the handling of lines. The dining room is wire-lighted by numerous port lights and has seating capacity for fifty people. Directly below the dining room on the starboard side is the galley with dumb waiter connection to pantry. The corresponding space on the port side is used for the crew's quarters. Directly aft of the engines and at the main gangway are the purser's office and toilet room with the staircase between.

The main cabin consists of a large saloon, opening off of which are fourteen staterooms. Each of these is fitted up with two berths, the upper one being hinged to drop down, forming a back for the lower, giving it a couch effect during the day. The saloon is lighted by two large skylights overhead and windows in the after end. The forward end is divided into two rooms, a smoking room on the starboard side and a ladies' parlor on the port side. Opening off of the ladies' parlor is a large toilet room.

The large pilot house forward of the cabin is fitted up for the captain's quarters. The hurricane deck extends from the pilot house to the after end of the boat and save for the cabin



THE MAYWOOD ON THE STOCKS.

skylights, is an unbroken promenade for the passengers.

The power consists of one triple-expansion engine built by Marine Iron Works, Chicago, and developing 700 H. P. The engine has cylinders of the following diameters: high pressure 14 in., intermediate 22 in., low pressure 36 in. The stroke is 24 in. Steam is supplied by a Scotch boiler 11 ft. 6 in. diameter by 12 ft. 10 in. long with 175 lbs. pressure. The diameter of the propeller shaft is seven inches, terminating in an 8 ft. 3 in. wheel. The boat is designed for a speed of 15 miles per hour. The engine room is further fitted with a Wheeler independent air pump and jet condenser and a 125-light Roth dynamo.



LAUNCH OF THE MAYWOOD.

AROUND THE GREAT LAKES

Dense fogs on Lake Superior have made navigation slow and dangerous during the present week.

The marine post office at Detroit reports that during the month of June 53,943 pieces of mail were delivered and 19,291 pieces received. This is higher than the average.

C. M. Handy, Cleveland, was the lowest bidder at \$93,160 for constructing a new stone superstructure and stone riprap in the south harbor section of the Buffalo breakwater.

Repairs to the steamer Amasa Stone which was in collision with the steamer Etruria have been completed at the Wyandotte ship yard and the Stone is again in commission.

The aerial bridge over the canal at Duluth has been closed for repairs which will be made by the Modern Steel Structural Co., Waukesha, Wis.

The keel of the new 500-ft. steamer building at the Craig Ship Building Co. of Toledo for the Toledo Steamship Co. has been laid.

After lying at the bottom of the river for nearly three weeks, the Gilchrist steamer City of Rome has been floated by Wrecking Master Harris W. Baker.

President Smith of the Great Lakes Towing Co. has decided to send the wrecker Wales, which has been stationed at Detroit for a number of years, to Lake Ontario. The Wales will be stationed at Toronto or Kingston. She will be overhauled before she goes to Lake Ontario.

The American schooner Bruce on her way to Mexico from Cleveland reached Montreal in charge of the mate. While going through the Cornwall canal Capt. H. L. Wilson became entangled in a hawser and had his leg terribly crushed. He was taken to the Cornwall hospital, where the limb was amputated below the knee. The Bruce is laden with coal.

In the supplementary estimates just voted by the House of Commons at Ottawa appears an item of \$673,000 for the construction of new lighthouses in river St. Lawrence and at great lakes points, \$175,000 for the new ice-breaker for the St. Lawrence and \$50,000 for the new Canadian-American steamship service.

With a full complement of officers and a newly shipped crew, the United States revenue cutter Morrill is now being rapidly fitted out to go on her new station between Mackinac island and Niagara river. Before starting, however, she is to be put in dry dock for repairs to her stern bearings and general inspection below her water line. She has not been docked since she was brought into these waters.

The appointment of a receiver for the Chicago & Muskegon Transportation Co. was last week demanded in the circuit court at Chicago by Thomas Hume of Muskegon, Mich. The complainant in the receiver's bill is the surviving partner of the lumber firm of Hackley & Hume, of which the late Charles H. Hackley was president. The Chicago & Muskegon company, of which Miles E. Barry was president, was organized with a capital of \$250,000 and operated the steamers C. H. Hackley and Alice Stafford.

The floating drydock which the Great Lakes Towing Co. has operated at Fairport will be brought to Cleveland next week and will be located in the Cincinnati slip in the upper part of the river. The deal for the use of the slip was closed last week and the work of dredging it to a depth of 22 ft. has been started. The drydock is large enough to handle the largest tugs and all the boats that are operated by the company at Ohio ports will be repaired at Cleveland. The drydock was built by the American Ship Building Co. In connection with the drydock the company operated a repair shop and a number of the tugs of the fleet were rebuilt at Fairport.

It is reported that in connection with the improvement of its terminal facilities in South Buffalo immediately adjoining the property of the Goodyear-Rogers Iron Co., the Pennsylvania railroad is contemplating the digging of another ship canal to connect with the harbor. That is but one feature of the plans which the Pennsylvania has mapped out for making its Buffalo terminals among the most comprehensive and complete in the world. The Pennsylvania has acquired a large tract of land immediately to the northwest of the Goodyear-Rogers holdings, the new ship canal just opened dividing the two properties. This ship canal is for the joint use of the Goodyear-Rogers iron plant and the Pennsylvania railroad. The plans for improvement which the Pennsylvania has in mind, however, are so extensive that evidently the single ship canal will not be adequate to meet the necessities of its terminals and a new ship canal with slips similar to those which the Lehigh has on its Tift farm terminals is to be built. The big holdings of the Pennsylvania are to be covered with tracks. In addition immense iron ore bins and coal trestles are to be built on the terminals equipped with the most approved apparatus for the rapid and economical handling of iron and coal.

LIVERPOOL SHIPPING LETTER

Liverpool, July 3.—The Mersey Docks & Harbor Board has this week approved an important scheme of new docks which will entail an expenditure of \$20,137,500. These new works include two new large branch docks, each with an entrance of 120 ft. in width, opening out of a gigantic half-tide dock, from which two entrances, each 130 ft. wide, lead to the river, together with a number of double-story sheds, and a new long river wall extending the present line of docks a considerable distance northwards. The river entrances will be 30 ft. below old dock sill, which means 40 ft. of water on a neap tide, and 51 ft. on a spring tide. This great depth has been thought to be necessary especially in view of the tendency to increase the dimensions of new vessels, and to the fact that New York harbor was being deepened to 40 ft., and the Suez Canal was to be made something like 34 or 35 ft. Besides the extremely wide entrances of 130 ft. it is important to note that these will accommodate a ship up to 1,000 ft. long. The new docks, however, have only been designed for vessels of 800 ft. long, for it is thought the 1,000-ft. ship is a long way off yet. In the opinion of Mr. J. W. Hughes, chairman of the Works Committee, which has brought forward this scheme, and who is also a member of the Suez Canal management, "an 800-ft. long vessel could easily be made to carry 40,000 or 50,000 tons, and they were a long way off the happy time when shipowners could get quite so large a cargo." In this connection it may be interesting to add that the increase in the trade of the port during the past twelve months ending Friday, June 30, is represented by nearly 400,000 tons. More than a quarter of the whole foreign trade of the United Kingdom came in and went out of the port of Liverpool and its continued growth is overtaking the dock accommodation available. Further, the huge new vessels being built for the Cunard Company and others that are being talked about will require greater length, breadth and depth accommodation than is now provided, in fact the two new express Cunarders will draw from 37 to 38 ft. of water. It is to provide for such vessels as these, and generally keep well abreast of the shipping requirements of the port, that the present new dock scheme, occupying a total water area of 45.99 acres, apart from quay and shed space, is put forward.

The Sub-Marine Signal Co. of Boston, U. S. A., have fitted the Cunarder *Lucania*, which is the first British steamer to be so equipped, with a special sound-receiving apparatus. This takes the form of a pair of sensitive electric transmitters placed on the side of the ship against the plating below the waterline. By this apparatus, the sound waves, say, from a submarine bell, are collected and conveyed by a telephone to the bridge or pilot-house on the steamer concerned. In the case of the *Lucania* the submerged bell of the Sandy Hook lightship was sounded, and the *Lucania*'s telephone accurately indicated the number of strokes, although the ship was over two miles away from the lightship. The chief utility of the invention is, of course, in foggy weather when navigators have to depend upon the sense of hearing rather than sight to determine their exact whereabouts; and it is quite in keeping with Cunard traditions that they should be the first British steamship company to make a trial of this unique method of signaling.

A return has just been issued as a Parliamentary paper giving the number of days, hours and minutes occupied in the transit of the royal mails, both outward and inward, carried during the year 1904 by steamers between the three British ports of Queenstown, Southampton and Plymouth and New York. On the westward journey, the Cunard liners taking up the mails at Queenstown have a distinct advantage over the German and American vessels receiving their mails at Southampton, but on the eastward journey, the latter lines delivering their mails at Plymouth have the advantage of the Cunarders over the Queenstown route. The following abstract

gives the shortest runs, the time calculated being from the date when the mails were put on board to their receipt by the post office at the port of arrival:

TO NEW YORK.

	d.	h.	m.
Queenstown to New York, <i>Campania</i>	5	17	8
Southampton to New York, <i>Kaiser Wilhelm II.</i>	6	1	25
Southampton to New York, <i>Kronprinz Wilhelm</i>	6	1	25
Plymouth to New York, <i>Pennsylvania</i>	10	1	30

FROM NEW YORK.

New York to Plymouth, <i>Kaiser Wilhelm II.</i>	5	12	48
New York to Queenstown, <i>Campania</i>	5	19	5
New York to Southampton, <i>St. Louis</i>	7	1	30

As the return shows, the Cunard Line maintained its prestige for the quickest steaming with the mails to New York. It will be noticed that on the outward route from Southampton two German boats made precisely the same time.

The British Board of Trade and Trinity House Lighting Authority have concluded a contract with Marconi's Wireless Telegraph Co., Ltd., providing for the equipment of lightships with Marconi wireless telegraph installations. This arrangement will, it is stated, enable the lightships to communicate with the shore and with one another by wireless telegraphy for the ordinary purpose of the lightship service, and also to report ships in distress. It is now more than six years since the Marconi company, by installing wireless telegraph apparatus on the *Last Goodwin Lightship*, and working it in communication with a shore station, proved to the satisfaction of the Board of Trade and Trinity House that good telegraphic communication could be maintained by these means. Communication was maintained for several months during the latter part of which period the station on the lightship was worked by the lightship crew. The installations were found of great service to the lightship for ordinary communication, and on one or two occasions were of special utility in reporting damage from storms, and in securing prompt assistance. When after several months it was found that the Board of Trade and Trinity House were not in a position to make a contract for the continuance of the arrangement, the apparatus was removed, the company receiving the thanks of Trinity House and an expression of satisfaction with the service rendered. Representations have from time to time been made to the government by persons interested in the protection of shipping upon the desirability of effecting telegraphic communication between the lightship and the shore. Cable communication has, however, been found both expensive and uncertain, and until recently various difficulties have prevented the Board of Trade and Trinity House from concluding an arrangement with the Marconi company for a wireless service. These difficulties have, however, now apparently been surmounted, and a contract has been signed.

In this connection, the Marconi company here has received an intimation from the Marconi Wireless Telegraph Co. of Canada, that the installation of Marconi-equipped wireless telegraph stations at Sable Island and Halifax Cowperdown Station (under contract with the Canadian government) has just been completed, and these two stations are now in full operation. Marconi wireless stations at Whittle Rocks and Cape Rich are in course of erection and equipment, and will, it is expected, be in working order by July 31, by which date it is hoped that the effective range of the Marconi stations at Cape Ray, Heath Point and Fame Point will be increased to such an extent as to provide a complete inter-station service between the following stations: Fame Point, Heath Point, Cape Ray, Whittle Rocks, Cape Rich, Point Amour, Belle Isle, Cape Race, Halifax and Sable Island. This service has been established by the Canadian government primarily as an aid to navigation in Canadian waters, and with a view to establishing an efficient substitute for the land line service along the shores of the St. Lawrence, which is subject

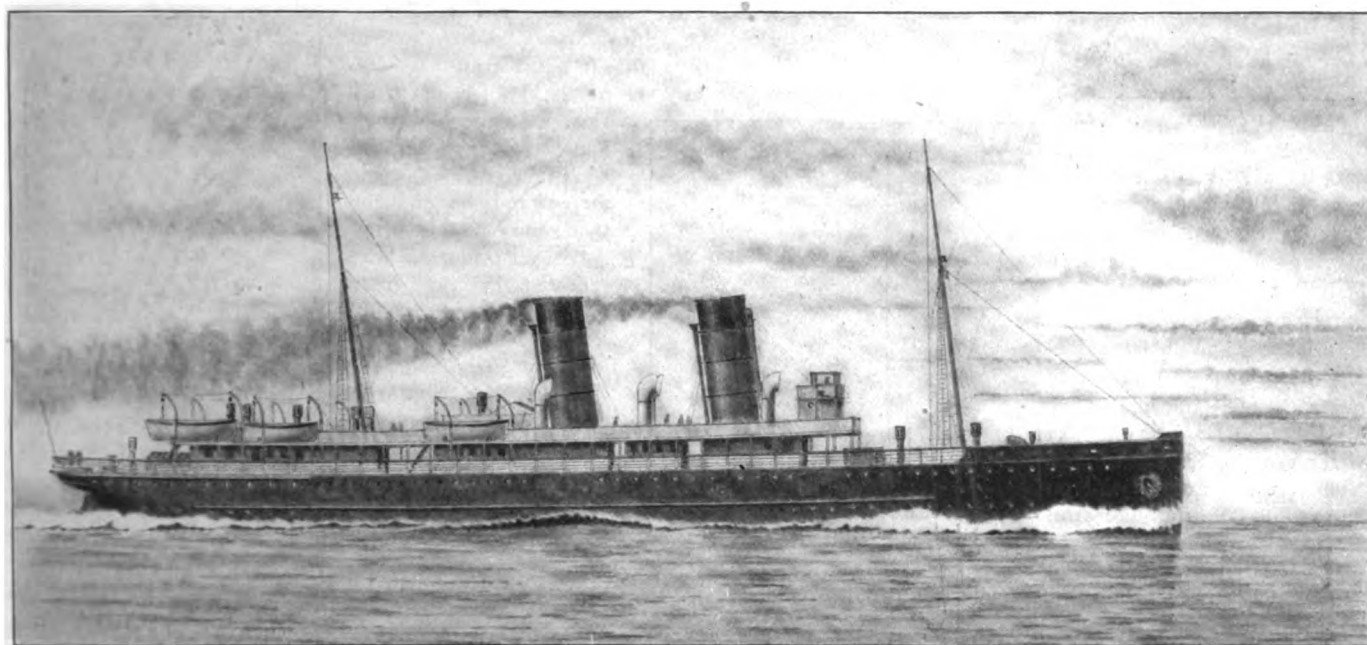
to frequent delays, caused by bad weather and the breaking of cables by ice floes.

It would appear that an attempt is to be made by the government of Canada to demonstrate that the mails from Great Britain can be despatched to Montreal, Buffalo, and the cities of Canada and the western states more rapidly by the Canadian than by the New York route. On her next trip from Liverpool on Thursday, July 6, the Allan Line turbine steamer, *Virginian*, will land the mails at Sydney, C. B., where a special train will be ready to convey them to the west, and every effort will be made to secure their arrival there in record time.

TURBINE PASSENGER STEAMER VIKING

Special interest attaches to the turbine passenger steamer *Viking* which ran a long-distance trial from the mouth of the Tyne recently, in that she is the first high-speed channel passenger steamer to be constructed on the Tyne and is probably

this main saloon is a ladies' saloon, fitted in light sycamore, and below on the lower deck are a large dining saloon and a supplementary saloon, the seats of which lift up to form a double tier of sofas. All this accommodation is light and well ventilated. The second-class quarters are, of course, much plainer, but they also comprise a main saloon with buffet, a dining saloon and a ladies' saloon. There are also a first-class smoking room, tea room and several private staterooms. The propelling machinery, supplied by the Parsons Marine Steam Turbine Co., consists of three sets of Parsons turbines, each driving an independent shaft; as usual, the two outside engines are low-pressure, and within their casings are fitted the astern-going turbines, which can give the vessel a speed of fourteen or fifteen knots. Steam at a pressure of 160 lbs. to the sq. in. is supplied by four double-ended boilers, working under forced draft in inclosed stokeholds; these were made by the Wallsend Slipway & Engineering Co. The two funnels



IRISH CHANNEL TURBINE STEAMER VIKING.

the fastest passenger steamer afloat at this moment. She was built at the Walker yard of Sir W. G. Armstrong, Whitworth & Co., to the order of the Isle of Man Steam Packet Co., and is intended for the summer excursion traffic between Liverpool and Douglas. She should be able to perform the crossing in three hours, and therefore it may be found possible for her to make two double trips every day in daylight. To meet the special requirements of this trade she is designed to carry a very large number of passengers—nearly 2,000—and to afford them ample accommodation in the way of promenade space, together with extensive facilities for refreshment, in the shape of numerous dining saloons and bars. Her shelter deck extends uninterruptedly from stem to stern—a length of 361 ft.—and above it is a big promenade deck, about two-thirds as long, which is carried out to the ship's sides and is thus 42 ft. wide at its broadest point.

The first-class accommodation is aft and the second-class forward, the middle part of the ship being mainly occupied by the boilers and engine room. The first-class saloon at the extreme end of the main deck is paneled in stained oak, relieved with photographs of good pictures and presents a handsome and comfortable appearance while not being overloaded with ornament; it is approached by a broad stairway from a companion house, on the shelter deck, the entrance to which is decorated with Dutch tiles. Immediately forward of

of the vessel are provided with spark-catching devices, which greatly add to the comfort of passengers by preventing ashes and cinders from being thrown out on the decks.

The trial trip that took place was a long-distance test of steaming at full speed, the course selected being along the Durham and Yorkshire coasts from Scuter Point, near the mouth of the Tyne, to Flamborough Head and back. The tide was about equally for and against the vessel and she carried a load equivalent to her full complement of passengers, giving her a draught of about 11 ft. She ran continuously at full speed for 6 hours 40 minutes and maintained a mean speed of 23.53 knots for the course in and out. The three hours' run southward was performed at the rate of 23.68 knots, and on her return she touched 24 knots for some distance. This performance is even better than the 23¼ knots she made on her trials over the measured mile off the Tyne, where, however, the depth of water is scarcely sufficient to give the best results at such high speeds. In spite of the high power of the engines the vibration is slight; in fact, over the greater part of the vessel it is imperceptible. It is true that in the lower first-class saloons, which are immediately over the screws and propeller shafts, there is a good deal of noise, which at first suggests considerable vibration, but if the columns and other fixed structures be touched it becomes apparent that the real vibration even there is very moderate indeed.

LAUNCH OF THE WILLIAM A. ROGERS



MR. WETMORE AND THE SPONSOR.

cort for a little girl, about ten years old, who was dressed entirely in white. It needed only a glance about to see that they had all gathered to launch another ship. Ships have indeed been launched on the lakes during the present year at a rate never before known. They have been dropping into the water every other week. The launch at the Lorain yard on Saturday last was as successful as any, probably a trifle more so, for her bow and stern struck the water at precisely the same instant, displacing an equal volume of water to the consternation of a number of little fishes that were either carried into the adjoining dry dock or left sprawling on the sands. Miss Alice Rogers, the ten-year-old daughter of Mr. Wm. A. Rogers, christened the boat in honor of her father and notwithstanding her extreme youth she did it very well indeed for she broke the bottle squarely on the bow of the steamer just as it started. She carried a beautiful bouquet of

Mr. Russel C. Wetmore, vice-president of the American Ship Building Co. was seen to enter the Lorain yard of the company shortly before noon on Saturday last with a suspicious looking oblong box under his arm. He was followed immediately by Mr. Robert Logan, general manager of the company, who carried a gigantic paper box 3 ft. long and 2 ft. deep. They both hurried forward at a rapid pace, leaving a party of about 200 ladies and gentlemen to follow leisurely. Their principal business seemed to be to act as es-



PAYING TRIBUTE TO GREAT LAKES TOWING CO.

pink roses, sweet peas and orchids, the gift of the ship building company.

After the launch the party took a train of special cars to the Clifton Club where luncheon was served. Mr. Russel C. Wetmore presided at the luncheon and after regretting the absence of Mr. James C. Wallace, president of the company, introduced Mr. Harvey L. Brown of Buffalo as toastmaster.

Mr. Brown in his few introductory remarks said that this was an age of commercialism, but denied that commercialism was making for ruin of the country as had been charged. He maintained that while the spirit of the times was essentially commercial, it nevertheless stood for the development not only of material but of men as well. He thought that it was bearing its share of the burden of progress. A nation, he said, may be known by the condition of its commerce and he thought that the condition of American commerce was reflected by the great steamer, the Wm. A. Rogers, that the party CAPT. EDWARD SMITH INSTRUCT- had just seen launched. ING MR. J. G. MUNRO.

He then called upon Mr. Wm. A. Rogers.

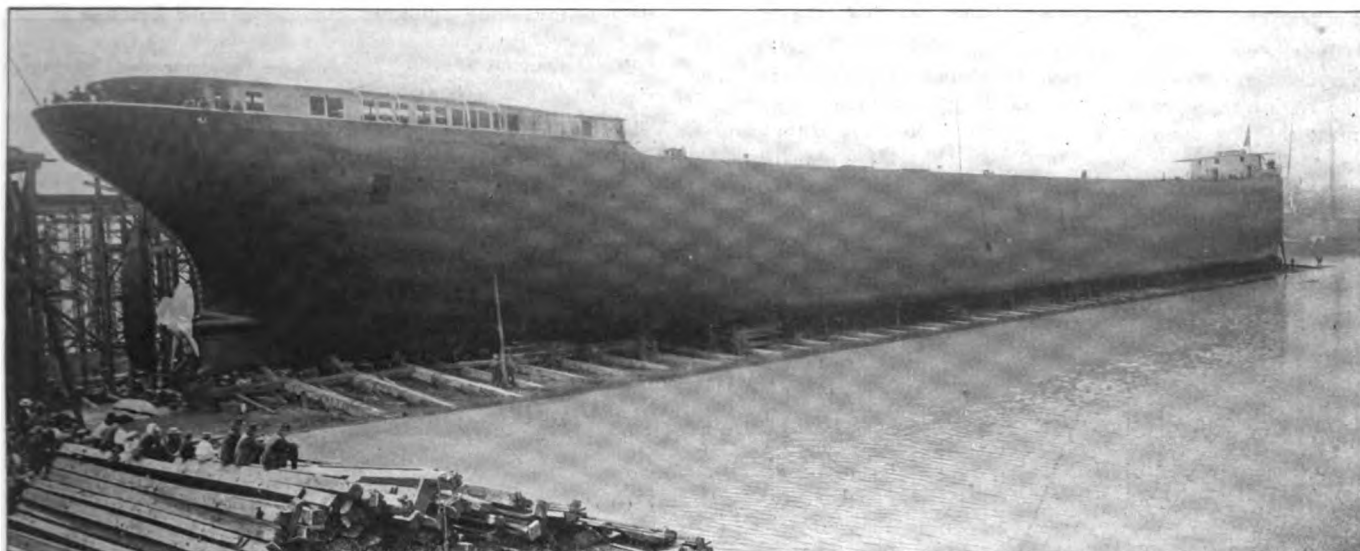
Mr. Rogers stated that if he had known when the stockholders tendered to him the courtesy of writing his name on the side of the steamer that it entailed upon him the necessity of making a speech he doubted whether he would have accepted it with quite the cordiality that he had exhibited. He hoped and believed the Wm. A. Rogers to be the best boat ever turned out by the American Ship Building Co. and

thought the launch of such a ship to be great in its significance because it represented the condition of the country.

"Nothing marks it more than this event," said he. "Few appreciate how rapid has been the development of our nation. It has occurred within a very short time. It has taken place indeed within the life of nearly everyone present. Twenty-five years ago the United States was one of the least



THE LAUNCHING PARTY.



THE WILLIAM A. ROGERS ON THE WAYS.

among the nations in the production of iron and steel. During the past two years its production has been greater than the production of Great Britain and Germany combined and during the present year it will probably exceed the combined production of Great Britain, Germany and France. Thirty years ago the iron trade was in its infancy. Today as much ore moves down the great lakes in two weeks as marked a full year's movement thirty years ago."

Mr. Rogers then spoke briefly upon the development of the Bessemer process, saying that it was the adaptability of lake ore to this process that had made it possible for the country to forge away in the production of steel rails with the result that it had become the greatest transportation country on the globe. Mr. Rogers thanked the American Ship Building Co. for the entertainment and thought that if a luncheon like the one that had just been enjoyed went with every ship it was no wonder their ship yards were crowded with orders.

Mr. Stephen M. Clement, president of the Marine National Bank of Buffalo, was next presented. He referred to the feeling of good fellowship which permeates business life today. In discussing commercial affairs he said he was constantly reminded of the great iron trade which was the foundation of all business, saying that in that great fundamental trade Mr. Rogers was in the front rank and that therefore the company present honored itself by honoring him.

Mr. N. D. Fish of North Tonawanda said that when the Niagara Transit Co. named their steamer after a great captain of industry it had to hail it, of course, from a corresponding

port and had therefore hailed it from North Tonawanda, the gateway to the east.

"What Duluth is to the northwest," said Mr. Fish, "what Chicago is to the middle west, Tonawanda will in the future be to the east. There is a place near Tonawanda, Buffalo I think they call it, where a great many of the business men of Tonawanda seek pleasure in its rural shades. However, they transact the serious work of the day at Tonawanda. I propose a toast to the coming imperial city of the inland seas—North Tonawanda."

This toast was drunk standing and with tremendous enthusiasm.

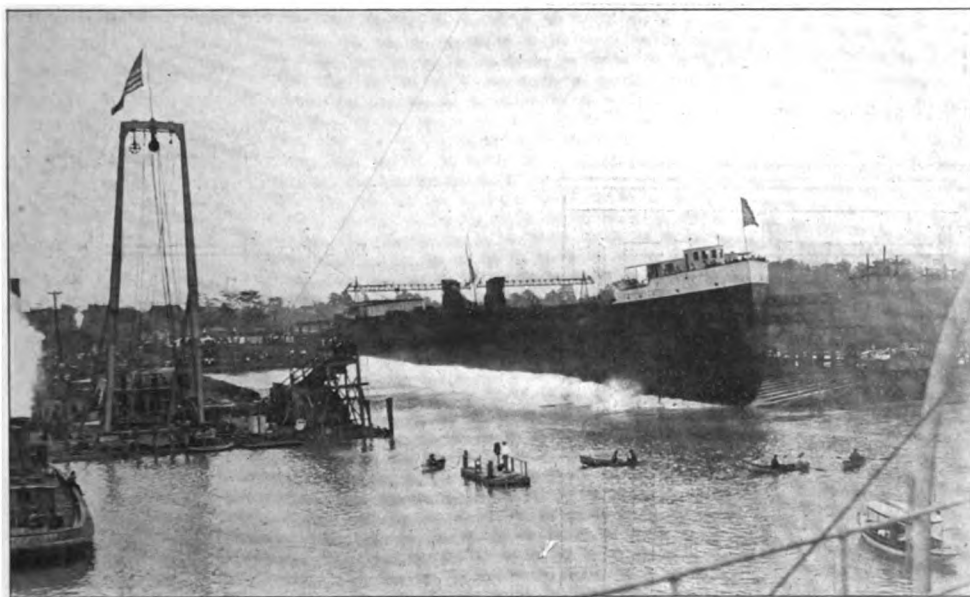
Mr. W. M. Mills was greeted with genuine and hearty applause when called upon. He contented himself, however, in remarking that all his friends knew he could not speak, "and all the rest of you," he added, "know it now."

Capt. J. J. H. Brown of Buffalo was called upon but declined to make any extended remarks on the ground that every other man who had spoken thus far was named Brown.

Capt. Edward Smith of the Great Lakes Towing Co. regretted that he had not been invited to take an interest in the new steamer, but found some contentment in the fact that she would have to pay tribute to him before she did to any of her stockholders.

Mr. Wetmore brought the launching to a close by proposing a toast to the little lady who had christened the steamer. Those present at the banquet were: Mr. and Mrs. Wm. A. Rogers, Miss Alice Rogers, William D. Rogers, Alden Rogers, Mr. and Mrs. J. E. Gilmore, Dr. and Mrs. J. H. Potter, Dr. and Mrs. J. C. Thompson, Miss Augusta Gilmore, Mr. and

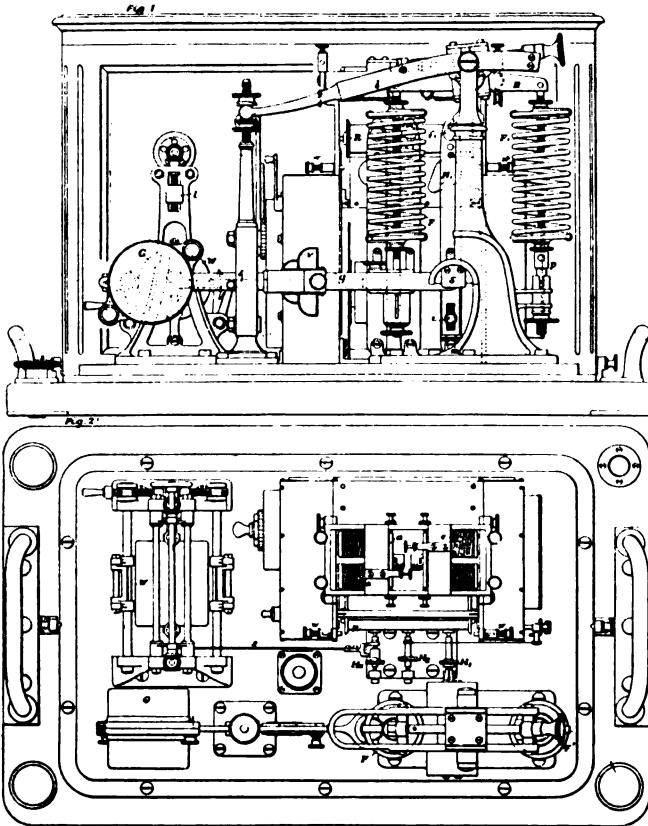
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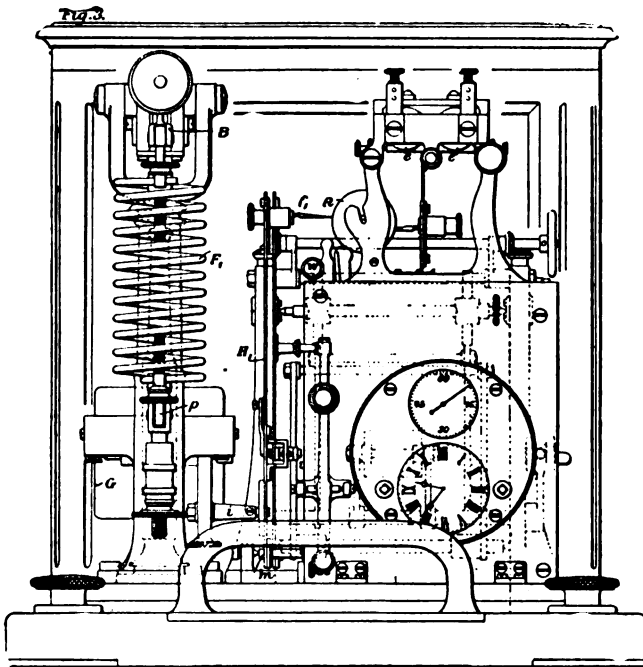
THE WILLIAM A. ROGERS TAKING THE WATER.

RECORDING THE VIBRATIONS OF STEAMERS

It is a well known fact that in steamships the periodically varying acceleration undergone by the reciprocating parts of the engine result in vibrations of the ship body. An instrument enabling the vibrations of the ship to be measured and



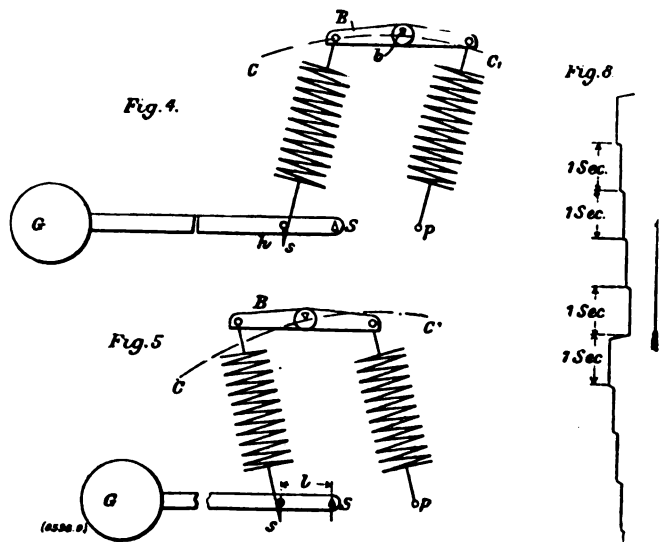
registered would obviously be of the highest importance, as by a thorough investigation of these vibrations their causes may be ascertained and eventually eliminated.



A highly interesting form of such an apparatus, called a pallograph, has just been designed by Mr. Schlick, and is being constructed by Mr. H. Mailhak, of Hamburg. This ap-

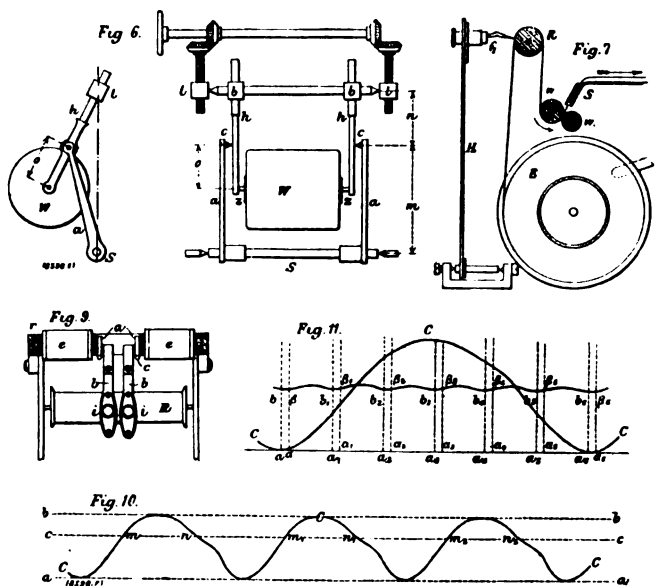
paratus traces the vibration amplitude of the keel by means of two steel pens upon a strip of paper, which slowly unwinds, being driven by clockwork. A third pen, impelled by other clockwork, produces each second a trace on the strip of paper. Some further pens, which are electrically driven from the engine, allow of the crank movements being registered.

The apparatus will prove useful also in running over the measured mile, giving, as it does, the exact time required up to 0.05 second. In addition to the characteristics of the vertical and horizontal vibrations of the ship, the apparatus further



gives the aggregate number of revolutions of the engine during the time required for running over the mile to within 0.02 revolution.

The apparatus illustrated herein consists of four main parts, one of which is for measuring the vertical vibrations. This consists of a horizontal forked lever, resting on knife-edge bearings at S, and carrying a heavy weight G at its other end. It is kept in a horizontal position by a system of two coiled springs F and F₁, which are coupled together by the horizontal balance-beam B. The tension of spring F₁ is adjusted by the screw p.



If, now, the apparatus be installed on a ship performing vibrations in an upward direction, the weight G will, by virtue of its inertia, tend to remain at rest, so as to appear to move

downwards, and inversely for a downward movement of the ship body. The period of the swinging weight is regulated by moving the point of suspension of B to the right or to the left on a curved path (see Figs. 4 and 5).

On one side of the pivot S, a small arm projecting downwards is fixed to the lever *g*, carrying a small adjustable horizontal pin *i*. This pin works in a slot in the vertical lever *H*, which at its upper end holds the tracing-pen, and at its

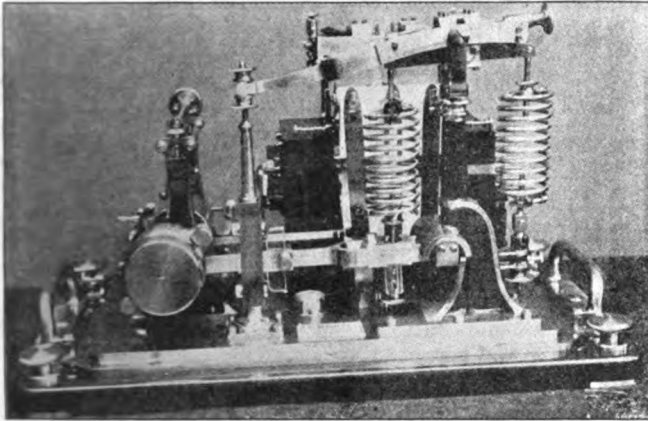


FIG. 12. PHOTOGRAPH OF THE SCHLICK APPARATUS ON BOARD THE CUNARD LINER CAMPANIA.

lower end can turn on the centres *m m*. If the weight *G* moves up and down, the lever *H*₁ will obviously be moved backwards and forwards by the pin *i*, so that the tracing-pen *f*, can mark the vertical oscillations of the weight *G* horizontally on the registering-tape traveling over the roller *R* (see Figs. 1 and 7).

The apparatus for measuring the horizontal vibrations consists mainly of a pendulum weight, suspended by means of a special mechanism. The cylindrical weight *W* hangs in a pair of sleeves (see *b, b*, Fig. 6) by the trunnion *z, z*, carried by the two rods *h, h*, which hang downward while being free to slide in the sleeves at their upper ends. These two rods *h, h* are supported by a pair of pins *c, c* at the upper ends of two lever-like arms *a, a*, which latter, again, are both attached to a shaft *S*. By adjusting the bearings *l, l* the period of oscillation of the pendulum can be so regulated that no synchronism occurs with any horizontal oscillation that may arise. A pin serves to transmit the motions of the pendulum by means of a light rod *s* to the tracing-lever *H*₂ (Fig. 2).

A side movement of the bed on which the instrument rests causes the pendulum apparently to move to and fro, imparting corresponding movements to the pen; the apparatus is so adjusted that the path described by the latter is exactly equivalent to that described by the weight *W*.

As regards the mechanism propelling the recording strip and the clockwork for registering the seconds, the strip is wound on a hollow cardboard cylinder *E*, whence it unwinds over the guide-roller *R* to the driving-roller *w* and to the press-roller *w*₁, coming out free through the guides *S* (see Fig. 7). The three tracing-pens *f*₁, *f*₂, *f*₃, are fitted to the upper ends of the levers *H*₁, *H*₂, *H*₃, the two former recording the vertical and horizontal oscillations respectively, while the lever *H*₃ is actuated by the clockwork in such a manner that it moves about 1-16 in. to the right during each second, springing back after every fifth second; the figure drawn on the strip to represent the time interval then has the appearance shown in Fig. 8.

The transmission of the motion of the propelling machinery to the roller *R* is effected by means of gearing wheels arranged for two different speeds.

Above the guide-roller *R* for the recording-strip a frame is arranged in which two small horizontal electro-magnets *e, e* (see Figs. 2 and 9) are fitted. In the middle of the frame

there are two pallets, *a, a* lying close together and each turning about a horizontal axis. These pallets bear each an arm *b* (see Fig. 9), which, at a point on the back of the roller exactly opposite the position of the before-mentioned tracing-pens, describes the required marks on the strip by means of a pen *i* fixed to its lower end.

As soon as an electric current passes through the coils of one of the magnets, the corresponding pallet is drawn up, turning through a small angle on the pin *c*, and causing the arm *b* with the corresponding tracing-pen to be moved slightly aside. Means are provided to establish the electric contact exactly at the instant of one particular engine crank passing through the dead point.

As regards the analysis of the diagram, Mr. Schlick recommends, first, that the curves shall be enlarged by means of photography, when they are analysed by the Fischer-Hinnen graphical method. After first determining the wave-length by means of a parallel drawn between the tangents *a, a* and *b, b* (see Fig. 10), the curve *c* of the sixth order is, for instance, determined as follows: After dividing the distance *a, a* into six parts (Fig. 11), ordinates are set up at the points *a*₁, *a*₂, *a*₃, *a*₄, *a*₅, when the points *b*₁, *b*₂, *b*₃, *b*₄, *b*₅, *b*₆, belonging to the curve of the sixth order are obtained by determining the arithmetic mean of the above ordinates, and setting off the distance at each of the station points. Further ordinates are next set off from the station points *a*₁, *a*₂, *a*₃, . . . *a*₆, which are shifted to the right of the first set of station points by equal distances *a, a* = *a*₁, *a*₁ = *a*₂, *a*₂ = . . . = *a*₆, *a*₆. The arithmetical mean of all the new ordinates is next determined and set up from the base line on each of them, thus obtaining the points *B*₁, *B*₂, . . . *B*₆, which also belong to the desired curve of the sixth order. By proceeding in the same way, any desired number of points of this curve is found. By next deducting the ordinates of this curve from those of the original curve *C, C, C*, a new curve, called *C*₃ *C*₃ *C*₃ is obtained, which contains all the curves of lower orders, those of the sixth and of any higher orders being eliminated. The curves of lower orders are subsequently determined in a similar way, by treating the new curve like the original one, and repeating the same process over again.

In Fig. 12 is shown a photograph of the Schlick apparatus showing its appearance as fitted up on board the Cunard liner Caronia, reproduced through the courtesy of *Engineering*, London.

The annual meeting of the stockholders of the International Mercantile Marine Co., which was to have been held yesterday after two adjournments, was again postponed, this time to July 18. It was said at the offices of the company in explanation of this last adjournment that the report of the European officers had not yet been received, and that until it was it would be impossible to complete the statement to be presented at the annual meeting. It is now expected that the report from abroad will be received in time to hold the meeting on July 18.

Plans of the two new steamers to be built for the Pacific Coast Steamship Co. have been made public and show some interesting details. Only one of the proposed vessels is, however, to be built soon, construction of the other to follow after completion of the first, when, it is expected, many minor improvements may be possible. But both steamers are to have steel deckhouses, and each vessel will have a capacity for 300 cabin and 141 second-class passengers, besides cargo space for 2,036 tons of cargo and 750 tons of coal in the bunkers. The steamers will be 405 ft. 6 in. in length, 44 ft. 6 in. in breadth and 29 ft. 1 in. in depth. They must show an average speed of 14 knots at a 22-ft. draught. Of twenty-two steamers owned by the company only thirteen have steel or iron hulls and nine are wooden.

(CONTINUED FROM PAGE 29.)

Mrs. J. G. Munro, Mr. and Mrs. Harvey L. Brown, Capt. and Mrs. J. H. Brown, Mr. John J. Boland, W. T. Shepard, Miss Margaret Shepard, Mr. and Mrs. Hugh Kennedy, Miss Julia Kennedy, Mr. and Mrs. E. D. Emerson, Mr. and Mrs. Horace Taylor, Mr. and Mrs. S. M. Clement, J. T. Kropp, B. A. Foote, R. T. Miller and Margaret Shepard of Buffalo; Mr. and Mrs. L. S. DeGraff, Mr. and Mrs. Wm. M. Mills, Mr. and Mrs.



MR. WILLIAM A. ROGERS.

Frederick Robertson and Master Fred Robertson, Mr. and Mrs. P. S. Humphrey, Miss Pauline Humphrey, Mr. and Mrs. W. B. Kerr, Jr., Wm. Cole, Mr. and Mrs. N. D. Fish and Mr. and Mrs. H. W. Clarke of the Tonawandas; Harvey D. Goulder, Capt. John Mitchell, Mr. Russel C. Wetmore, Mr. Robert Logan, Mr. Robert Wallace, Jr., and Capt. Edward Smith of Cleveland.

Mr. Wm. A. Rogers was born in 1851 and graduated from the scientific department of Yale in 1874. He then returned to his home city, Cincinnati, and entered the office of L. R. Hull & Co., pig iron merchants, as an invoice clerk. Three years later he was admitted to the firm as junior partner without being required to furnish any capital. In 1880 the firm of Rogers, Brown & Co. was formed, the partnership consisting of Archer Brown and Wm. A. Rogers. The firm has since been enlarged by taking in several other partners, there being at present seven members of the firm. In 1890 Mr. Rogers moved to Buffalo to take charge of the Tonawanda Iron & Steel Co. of which he had been elected president and of the branch office of Rogers, Brown & Co., which carried with it a general oversight of the manufacturing side of the firm's business. The firm of Rogers, Brown & Co. has at present offices at Cincinnati, St. Louis, Chicago, Cleveland, Buffalo, Boston, New York, Philadelphia, Pittsburg and Birmingham, Ala. It is interested to the extent of operating twenty-four blast furnaces engaged in the manufacture of foundry iron

which is the specialty of the firm. Rogers, Brown & Co. of which Mr. Brown is the senior member, is a mercantile firm dealing in pig iron separate and distinct from the several corporations which own the furnaces operated under the supervision of the members of the firm. Mr. Rogers is president of the Buffalo & Susquehanna Iron Co. with two furnaces at Buffalo; president of the Tonawanda Iron & Steel Co. with two furnaces at North Tonawanda, N. Y.; president of the Punxsutawney Iron Co. with one furnace in western Pennsylvania; vice-president of the Iroquois Iron Co. with two furnaces at South Chicago; director in the Cleveland Furnace Co.; president of the Niagara Iron Mining Co. of Michigan, and president of the Rogers Iron Mining Co. of Minnesota.

The Rogers is the third largest vessel to be built at the Lorain yard, being 545 ft. over all, 504 ft. keel, 54 ft. beam and 30 ft. deep. Her engines are triple-expansion with cylinders 23½, 38 and 63 in. cylinder diameters by 42 in. stroke, supplied with steam from two Scotch boilers, 14 ft. 6 in. by 11 ft. 6 in., equipped with Ellis & Eaves draft. She will carry 10,000 tons of ore.

Capt. Thomas Deringer will sail the Rogers and Frank Trinkwalder will be her chief engineer.

CONTRACT FOR TWO LARGE STEAMSHIPS

Two of the largest merchantmen ever built on the Pacific coast, are to be shortly constructed at the Union Iron Works, San Francisco. The contract for these large steamers has just been signed. This information was embodied in a telegram received at San Francisco July 8 from Robert Forsyth, president of the Union Iron Works, to Vice-President George Fredericks, which stated that Forsyth has just closed a contract with the American-Hawaiian Steamship Co. for the construction of two large freight steamers to cost in the aggregate \$2,000,000. The vessels are each to be 500 ft. long, with a 60 ft. beam, and 35 ft. moulded depth. Speaking of the contract, Vice-President Fredericks said:

"This means the beginning of renewed activity in the San Francisco ship building industry, and marks the end of the quietude due to the ship builders' troubles, which tied up the Pacific coast industry. In fact this contract is the first of any importance signed up by the Union Iron Works since those difficulties in the ship building trust."

Since the local works passed into the hand of Schwab and other eastern capitalists, there have been many important changes in the general management of the Union Iron Works Co., and it is believed that with the extensive improvements now in progress, San Francisco will have the building of many more such vessels; and that the Union Iron Works is in a position to compete successfully with any other concern in the United States.

Under the old regime President Forsyth had charge of the engineering department, and his name is associated with the successful construction of more than twenty government vessels built for the United States, as well as the Japanese cruiser Chitose, which has rendered an excellent account of herself in the war with Russia, and is called by the Japanese "The Greyhound of the Navy."

The two vessels to be constructed are for one of the largest steamship companies flying the American flag and engaged exclusively in Oriental freight transportation. Naturally, the officers of the Union Iron Works feel gratified that after having built three other ships for the same company they should be awarded the contract of constructing two more.

The intermediate cylinder of the starboard engine of the White Star liner *Majestic* cracked while the steamer was en route to this country last week. Four of the engine room force were badly scalded but managed to shut off steam before serious damage was done.

SUMMARY OF NAVAL CONSTRUCTION

The monthly summary of naval construction shows that in the race between the battleship Louisiana, building at the Newport News yard, and the Connecticut, building at the New York navy yard the score is virtually tied. Following is the summary:

Name of Vessel.	Building at	Degree of completion.	
		Per cent.	
		June 1.	July 1.
BATTLESHIPS.			
Virginia	Newport News, S. B. & D. D. Co.	87.38	89.71
Nebraska	Moran Bros. Co.	72.4	75.
Georgia	Bath Iron Works.....	80.01	82.66
New Jersey	Fore River Shipbuilding Co..	84.8	86.2
Rhode Island	Fore River Shipbuilding Co..	87.6	88.8
Connecticut	Navy Yard, New York.....	77.73	80.74
Louisiana	Newport News, S. B. & D. D. Co.	77.55	80.79
Vermont	Fore River Shipbuilding Co..	51.1	53.6
Kansas	New York Shipbuilding Co..	54.	55.1
Minnesota	Newport News, S. B. & D. D. Co.	65.42	68.
Mississippi	Wm. Cramp & Sons.....	29.09	31.28
Idaho	Wm. Cramp & Sons.....	27.18	29.57
New Hampshire	New York Shipbuilding Co... 7.2		11.2
ARMORED CRUISERS.			
California	Union Iron Works.....	76.2	78.3
Maryland	Newport News, S. B. & D. D. Co.	100.	
South Dakota	Union Iron Works.....	74.	76.1
Tennessee	Wm. Cramp & Sons.....	75.73	79.40
Washington	New York Ship Building Co.	76.3	79.1
North Carolina	Newport News, S. B. & D. D. Co.	6.03	9.14
Montana	Newport News, S. B. & D. D. Co.	5.32	7.98
PROTECTED CRUISERS.			
St. Louis	Neafie & Levy S. & E. B. Co.	65.3	67.4
Milwaukee	Union Iron Works.....	73.8	75.2
Charleston	Newport News, S. B. & D. D. Co.	94.98	97.
GUNBOATS.			
Dubuque	Gas Engine & Power Co.....	99.4	100.
Paducah	Gas Engine & Power Co.....	85.4	88.9
TRAINING SHIPS.			
Cumberland	Navy Yard, Boston.....	95.	95.
Intrepid	Navy Yard, Mare Island....	97.5	97.5
SCOUT CRUISERS.			
Chester	Bath Iron Works.....	0.	0.
Birmingham	Fore River Shipbuilding Co..	0.	0.
Salem	Fore River Shipbuilding Co..	0.	0.
TORPEDO BOATS.			
Goldborough	Wolff & Zwicker.....	99.	99.
O'Brien	Lewis Nixon	99.	99.
COLLIERS.			
Erie	Navy Yard, New York.....	0.	0.
SUBMARINE TORPEDO BOATS.			
Sub. T. B. No. 9	Fore River Shipbuilding Co..	0.	0.
Sub. T. B. No. 10	Fore River Shipbuilding Co..	0.	0.
Sub. T. B. No. 11	Fore River Shipbuilding Co..	0.	0.
Sub. T. B. No. 12	Fore River Shipbuilding Co..	0.	0.

PERSONAL

John F. Stevens, chief engineer of the Panama canal, expects to sail for Panama in a few days with President Shonts of the commission. Mr. Stevens expects to make his permanent headquarters in Panama.

Ralph M. Parsons, formerly of the firm of Kreer & Parsons, ship engineers and builders, Chicago, has bought out the interests in the firm, of Mr. Kreer, and will continue the busi-

ness under his own name. The shipyard and works at Nos. 2 to 24 Lawrence street, Chicago, have been greatly enlarged by the addition of new buildings and the installation of new machinery, giving greater facilities for handling the growing volume of business that has been constantly in evidence since the firm started in business several years ago. Mr. Parsons will continue to make a specialty of steel tugs, lighters, barges and stern-paddle, shallow-draught, steam and gasoline boats for river service. At the present time he has under course of construction for shipment to Central America, one 55 ft. by 7¼ ft. galvanized steel twin screw steamer of special design; also one 50 ft. by 10 ft. wood inspection launch for the Mexican government. In addition to these, he is building the steel frame for a composite, single screw steam river launch, 55 ft. by 10½ ft., as well as the steel frames for two stern paddle wheel launches, 42 ft. by 9½ ft. for shipment to Bolivia.

ITEMS OF GENERAL INTEREST

The keel has been laid for the four-masted schooner to be built by the Pendleton Bros. in their yard at Belfast, Me. She is to be 180 ft. long.

The Lindstrom ship yard at Aberdeen, Wash., is to be extended. A new shop will be built 120 ft. long, 54 ft. wide and 40 ft. high.

The New England Ship Building Co., Bath, Me., will build for S. B. Hart, Baltimore, a four-masted schooner 175 ft. keel, 29 ft. beam and 13½ ft. deep.

E. Wilberg, P. O. Box 215, Georgetown, Conn., who is shortly to return to his home at Frederikstad, Norway, is desirous of obtaining the American agency for ship supplies such as windlasses, winches, anchors, chains, steering engines, etc. He is a consulting mechanical engineer by occupation and claims to be able to furnish abundant security.

The Bendixsen Ship Building Co., San Francisco, has secured the contract for the construction of the new steamer to be built for the Hammond Lumber Co. The vessel will be 201 ft. in length, 38 ft. beam and 16.6 ft. depth with 800,000 ft. lumber capacity and accommodations for thirty-five cabin passengers. She will have triple expansion engines of 700 H. P.

The steamship Mariposa of the Oceanic Steamship Co.'s fleet recently underwent a trial trip under the supervision of Rear Admiral W. H. Whiting, Capt. H. N. Stephenson and Naval Constructor J. G. Tawresey, to determine her availability for ocean mail service. She exceeded the speed requirements by over two knots and the trial was in every way satisfactory.

Princess Arisugawa of Japan, who was accompanied by the prince, her husband, launched the Japanese battleship Katori at Barrow last week. The Katori's tonnage is 16,400 and her contract speed 18½ knots. Her armament consists of four 12-in. guns, four 10-in., twelve 6-in., ten 12-pounders and a number of small rapid-fire guns. Prince Arisugawa, in a speech at the luncheon which followed, said she "would help to guarantee future peace in far eastern waters and uphold the national dignity of Japan."

The Cunard Steamship Co. is fitting its entire fleet with the submarine signal bells, such as have been tried successfully on the three big North German Lloyd liners, Kaiser Wilhelm II., Kronprinz Wilhelm and Kaiser Wilhelm der Grosse. The Lucania, which arrived Saturday, is provided with the bells and used them with good results on the last voyage. The Caronia, Campania and other big Cunarders are to have the new system. The sound of the bells travels through the water and is intercepted by receivers attached to the inside of the vessel near the bottom. The officer on the bridge hears the signals through a telephone and can tell exactly the direction the sound comes from and the distance his ship is from the lightship or land station.

AS BUFFALO VIEWS IT

Buffalo, July 4.—Plunge! and another big freighter drops into the water and then another and another. Then I look over into the Ohio basin and see the three New York Central line steamers huddled up side by side, just where they were last winter and reflect that the list of lake vessels displaced by the new ones is constantly growing and I ask some anxious questions of a veteran vessel owner. "Where is it all to end?"

He takes the matter just as coolly as if he didn't have a small fleet of small craft going to the wall in just this fashion. It is all right. A mere matter of self-preservation, not of the individual vessel, but of the lake trade. Nature has no regard for the individual and we are sometimes tempted to say that Divine Providence is no more considerate, and so business is driven to the same course to all appearance and to the same end. The individual disappears, usually in bad shape and the new and more capable individual takes the place and the economy of the world goes on. It is a cruel world, in this as well as in many other things, and there is often much disposition to complain when it happens that the wheel of progress rolls over us or our possessions, and it is usually small comfort to point out the "injustice" that has been done us.

But it is the big vessel that is saving the lake trade, our vessel owner says. If the lake fleet had remained down to the size of the vessels he has left, the trade would be ruined by this time and he would be no better off than he is now. Look at the Erie Canal—no more capable of meeting railroad competition than it was 40 years ago and consequently out of the race for business. Yet the country opponent of canal enlargement still points out the fact that there is water enough and there are facilities enough to carry all the freight to be had. That is all true, but so long as it cannot be carried at a profit such arguments are vain.

The railroads have made the advances they have by means of a wholesale slaughter of every appliance that can be improved upon. When the Lackawanna Steel Company, that owns our big steel plant, took over the property of its predecessor, the Lackawanna Iron & Steel Co. of Scranton, Pa., one of its legacies was a big equipment of "jimmies"—dump coal cars holding six tons or so. They were still entirely to the mind of the dealer, who is so put out now by the steel hoppers of all the way to 100-ton capacity, but they were not money makers and so they had to go. One of the first things the company did was to make a bonfire of the whole lot.

Vessel owners do not like to do this and they would have kept the entire lake fleet down to the 1,500-ton size or smaller if they could. It was just a picnic for this fleet to take 80 cents a ton on coal to Chicago all one summer a little more than a dozen years ago. Everybody thought so, but it was really about the worst thing possible to the future of the lake trade. A few more such fat seasons and the fleet would have been found insufficient to do the business, the roads, which had already been creeping up towards this traffic, would have made a dash and there would have been an end of the lead of the lake freighter in coal carrying. It came pretty near to it as it was. Coal shippers were saying that it was cheaper to ship all-rail and were proving it when they were in no hurry to move the coal.

The recent history of the old schooner H. C. Winslow at Chicago has set some of the older vessel men to spinning yarns about her and her like in the days when there were plenty of them. She had passed her usefulness years ago, but there must have been someone with a tender feeling towards her and she was allowed to lie in Chicago river right in the way of live craft. One day it was concluded to tow her out into deep water, but it was found that she was too far gone for even that. They talk of farms in a slighting fashion some-

times that "wouldn't sell for the cost of the improvements on them," though they, like the abandoned lake vessel, may have earned fortunes in their best days.

The Winslow made history pretty fast sometimes in her day. It was about 1871 that she went ashore in the vicinity of Sleeping Bear Point and drowned the entire crew, including the owner and some women, spite of the fact that she was loaded with lumber. The new lake fleet is going to cut down crews to the limit, but it is not going to play them false as the old wooden vessels used to. Who hears in these days the familiar old jibe, the last effort in the line of combined pleantry and bitterness, of sending out a crew in a floating coffin? Safety to life may be a mere incident as a plain matter of business, but it is pleasant to the observer to find that the new fleet accomplishes it while it is saving the lake trade as a competitor with the railroads.

MANILA, OUR FUTURE HONG KONG

Editor *Marine Review*: The insular government of the Philippine Islands is entitled to credit for the energy it is displaying in bringing the Manila harbor improvements to completion. Bids are called for the construction of two new wharves in the harbor, one 600 ft. long by 70 ft. wide, and the other 100 ft. by 650 ft. Also a dock of stone and concrete. The latter is on the military reservation. Six or seven more docks are to be built. Notwithstanding the skepticism of Professor Alleyne Ireland and others there is no doubt that Manila will eventually rival Hong Kong as a shipping and trade center. In fact, in time Manila should outstrip Hong Kong, which though built on a barren rock has become one of the world's chief seaports.

Already the Hill Line of steamships emphatically states that it will make Manila the distributing and collecting point for their trade with French China, the Straits Settlements, Java, Borneo, India and Australia. This alone will open a new avenue for Philippine enterprise, and American commerce with these countries will use the port of Manila to and from the Pacific Coast to the far east. The insular government is providing the facilities for handling cargo rapidly, the completion of which will bring business. It's just like trolley cars, telephones, electric lights, etc., the greater the facility the greater the use. England found that out when Rowland Hill started penny postage. Given completed harbor improvements at Manila the trade of the islands and our trade with the islands will improve and improve rapidly. Given the completed American Panama canal and more American ships and the increase will be larger and far more rapidly increased.

Schenectady, N. Y.

WATLER J. BALLARD.

MEAN STAGES OF WATER

The gage records of the United States lake survey show the following mean stages of water above mean sea level, for June, 1905:

	Stages during June.	Higher Lower		Higher Lower	
		than during same month last year.		than during June, 1895.	
	Feet.	Feet.	Feet.	Feet.	Feet.
Lake Superior.....	802.76		0.01	0.06	
Lake Michigan.....	581.86	0.01		1.18	
Lake Huron.....	581.40		0.02	1.21	
Lake Erie.....	572.96		0.56	1.89	
Lake Ontario.....	246.44		1.25	1.65	

Present fall, Lake Huron to Lake Erie, 0.54 ft. more than year ago.

The steamer George W. Perkins, recently launched at the West Superior yard of the American Ship Building Co., is practically ready to go into commission.



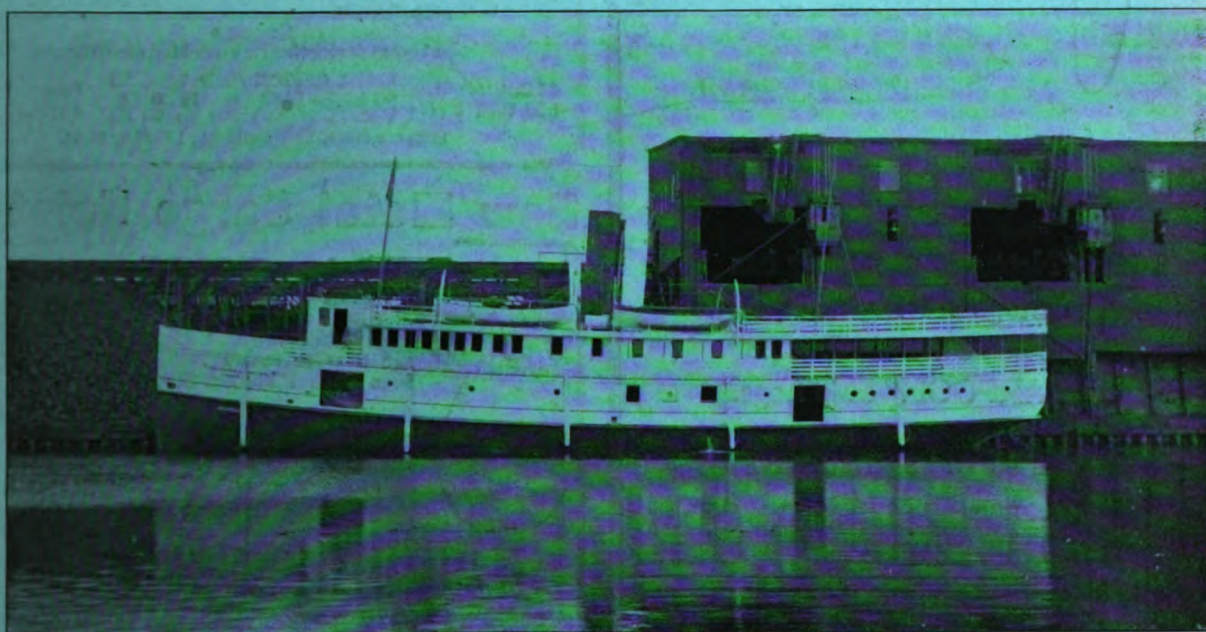
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CLEVELAND, O., JULY 13, 1905.

No. 2.

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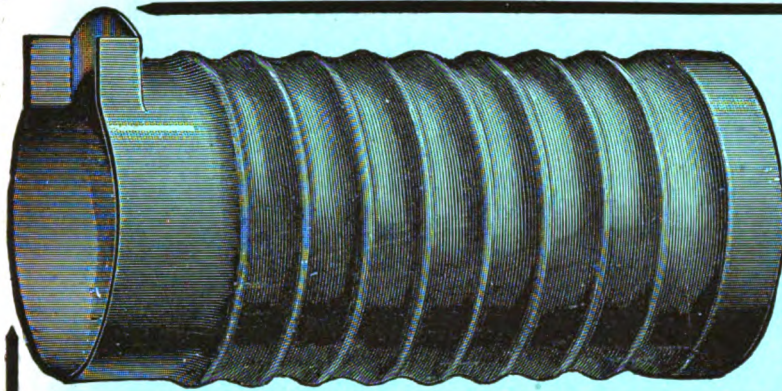
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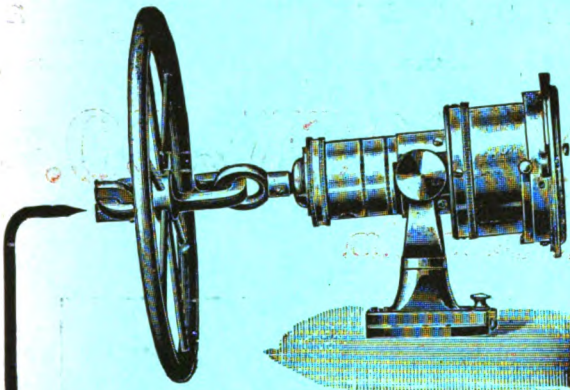
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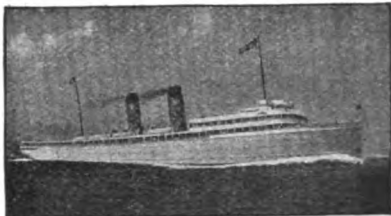
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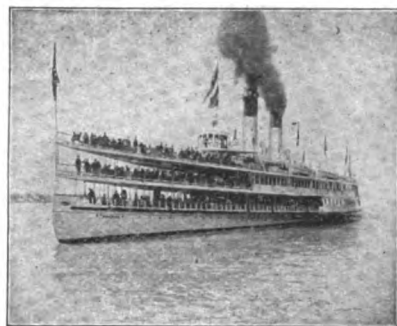
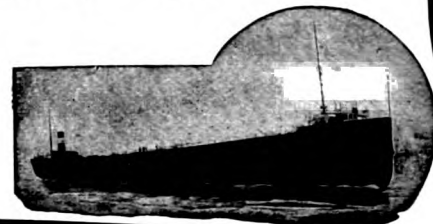
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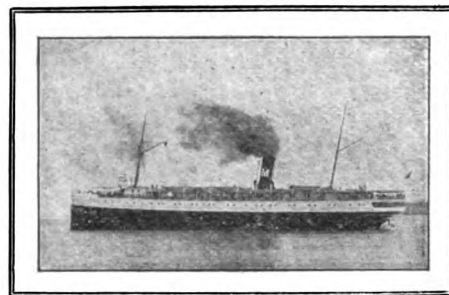
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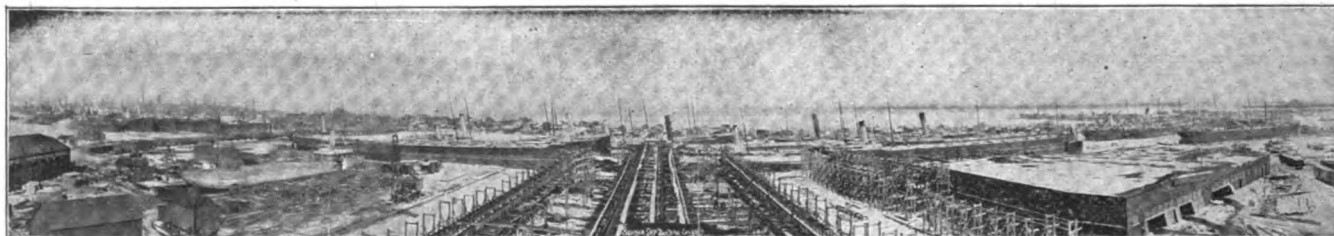


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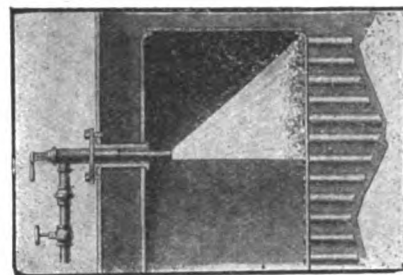
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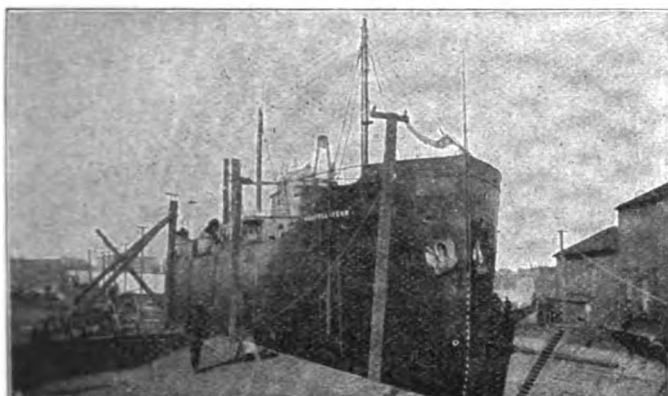
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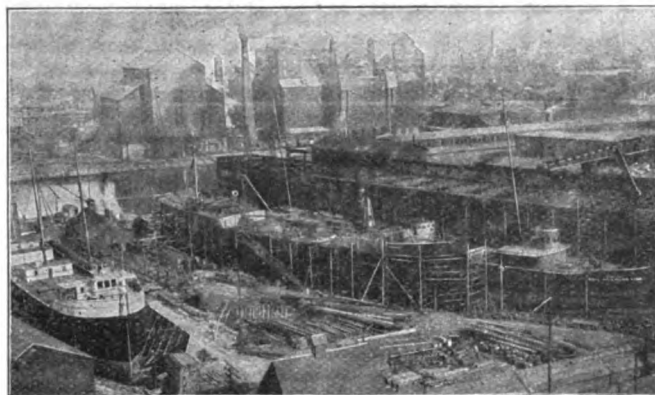
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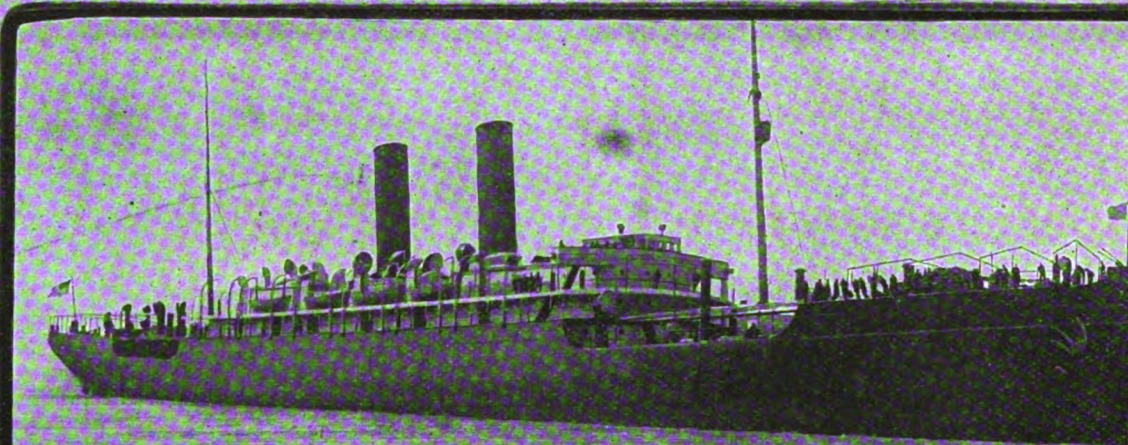
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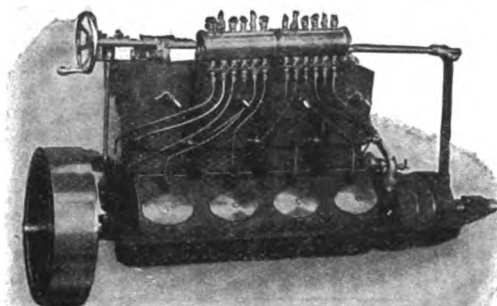
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FROM 80 TO 365 DAYS AND NIGHTS WITHOUT ATTENTION AND CAN BE SEEN AT A DISTANCE OF SIX MILES.

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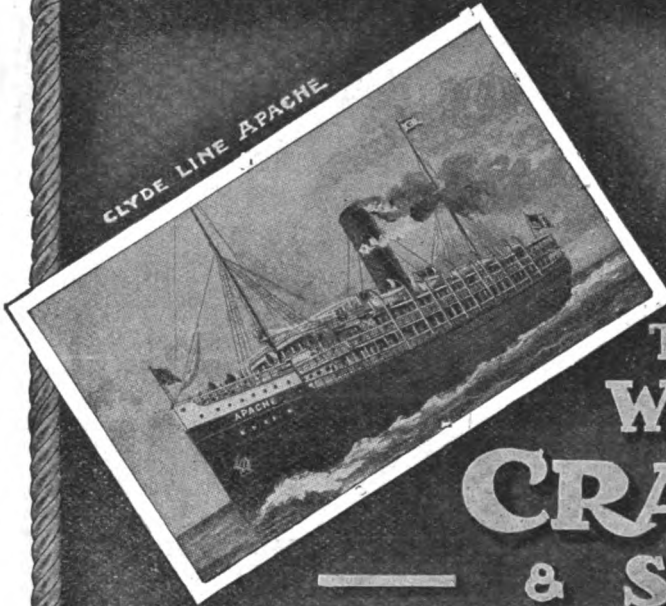
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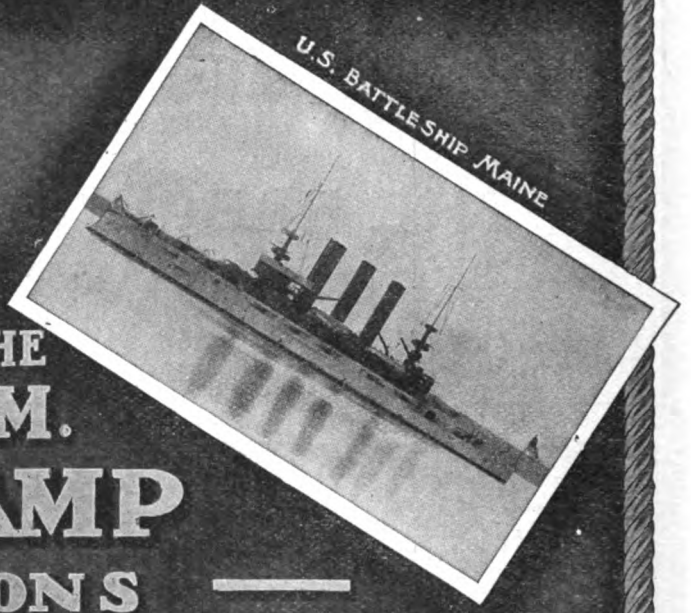
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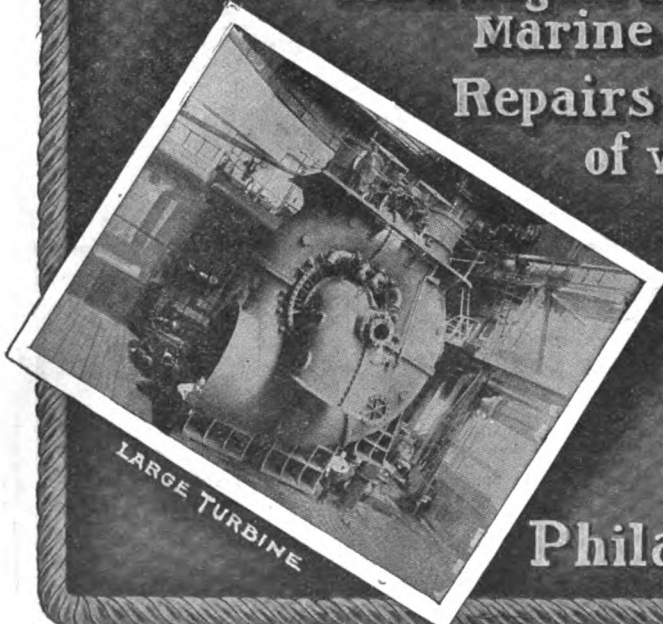
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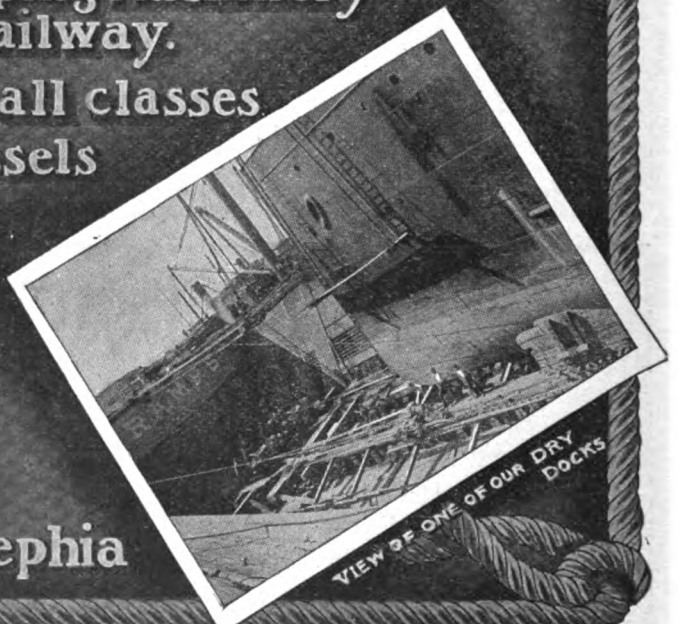
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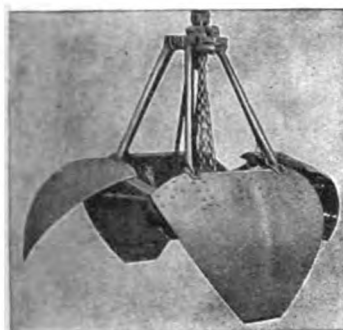
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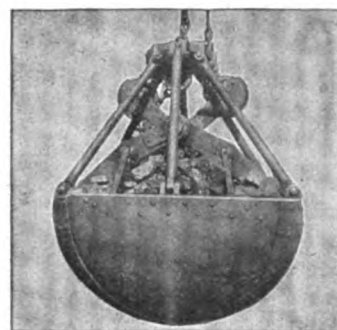
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12 Pockets.

Platform.

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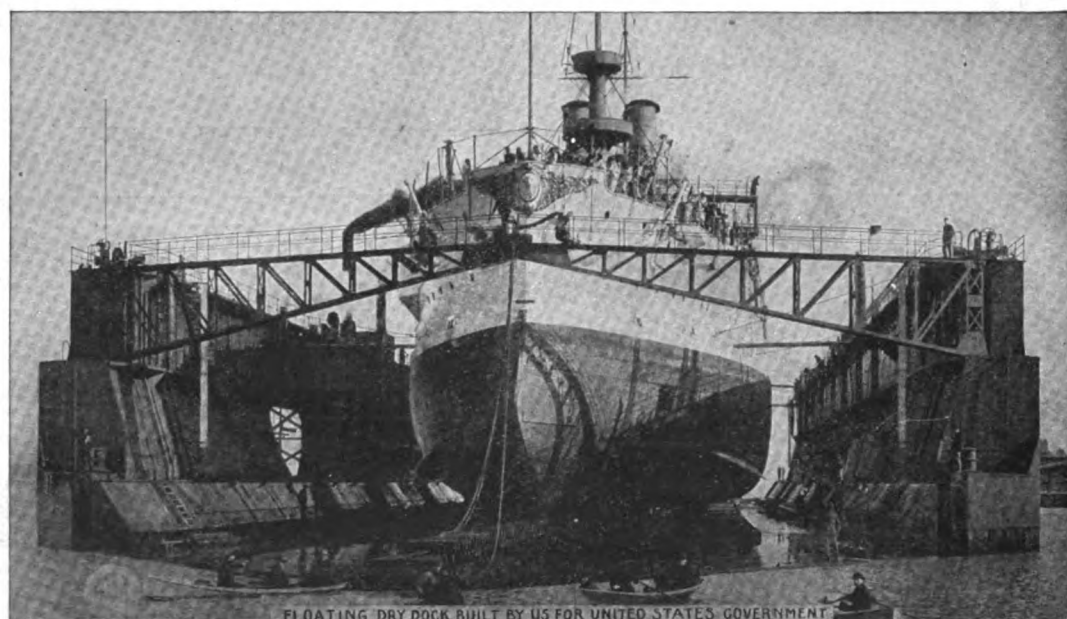
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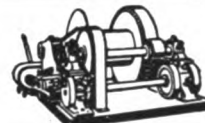
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Somewhat the cheapest, and altogether the best. Positively guaranteed.

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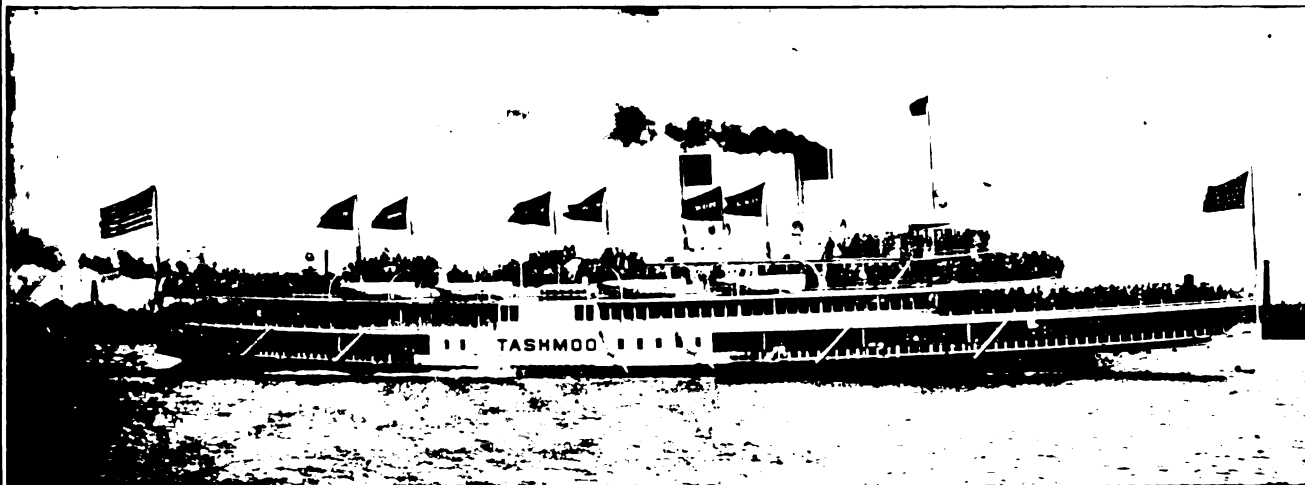
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The launch.
Castalin.
Chloron.
Chippawa. (Canadian).
Chippawa. (American).
City of Alpena.
City of Bangor.
City of Erie at Buffalo Docks.
City of Erie.
Columbia. (On the Ways—Three Views).
Columbia.
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Hondside, Bow and Stern.
Eastern States. (On the Ways—Three Views).
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Excelsior. (Detroit Ferry).
Fairbairn.
H. C. Frick.
Garland. (Detroit Ferry).
Glidden—Wreck of, in St. Clair Ship Canal.
Greyhound.
Hanna, M. A.
Harlem.
Harvard. (On the Ways).
Harvard. (The Launch).
Harvard. (In the Slip—Two Views).
Helena.
Hennepin.
Holley, Alexander (Whaleback tow-barge).
India.
Islander. (Thousand Islands—Three Views).
Frank E. Kirby at Put-in-Bay.
Lagonda discharging coal at docks.
Lackawanna.
Mahoning.
Manitou.
Majestic. (Three Views).
Michigan Central in Detroit River.
Winter).
Mohawk.
Montana.
W. B. Morley, wreck in Detroit River, Aug. 6, 1900.
Simon J. Murphy. (On the Ways).

Simon J. Murphy. (On the Ways—Two Views).
Simon J. Murphy, Launch. (Bow in Slip, Stern not yet in Water.)
Neshota.
New Island Wanderer. (Thousand Islands).
New York. (Thousand Islands—Two Views).
North King. (Thousand Islands).
North Land.
North Land, in the "Boo" Locks. (Two Views).
North Land, at Mackinac Island. (Two Views).
North Land at the Docks, Mackinac.
North Land and North West in Winter Quarters.
North West.
Ongara. (Two Views).
Ontario, in the Ice. (Transfer Steamer).
Pathfinder, in the Locks.
Peerless, at Mackinac Island.
Pere Marquette No. 17.
Plankinton, at Northwestern Coal Docks, Duluth.
Pleasure, at Dock (Detroit Ferry).
E. C. Pope.
Princeton.
Ramapo.
W. D. Rees.
Renascence.
Rube Richards, in Ship Canal at Duluth.
St. Lawrence (Thousand Islands).
Ste. Marie, in Mackinac Straits.
Howard L. Shaw. (On the Ways—Three Views).
Howard L. Shaw. (The Launch).
Howard L. Shaw. (In the Slip).
Sir William Siemens.
Superior. (Steel Trust Tender).
Tashmoo. (In Dewey Naval Parade, Detroit River).
Tashmoo, June 9, 1900.
Tashmoo. (Entering St. Clair Flats Ship Canal).
Tashmoo. (Landing at Star Island—Two Views).
Thompson, A. D. (Whaleback).
Toronto. (Thousand Islands).
Toronto. (Thousand Islands— at Alexandria Bay).
Toronto. (Thousand Islands— at Gananoque).
Transport, in Detroit River, Winter. (Car Ferry—Two Views).
Troy.
Uganda, in Ship Canal at Duluth.
United Empire.
Capt. Visger. (Thousand Islands).
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L. S. & M. S. Ry. Ore Docks—ore on docks.
Car Dumping Machine—two views.
Fueling Lighter with Clam Shell Hoist.

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Lackawanna Coal Chutes, two views.
Lackawanna Ore Docks—unloading ore.
Lackawanna Ore Docks—unloading ore and loading coal.
Unloading Ore from Whaleback, two views.
Unloading Wheat into Elevators, two views.

CHICAGO, ILL.
Chicago River Elevators.
Lake Front, from Illinois Central Station.
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CLEVELAND, O.
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Globe Iron Works Ship Yard, Laying Keel of No. 400.

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Car Dumping Plant, two views.

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Water Front, Detroit, from Windhor—7x17 inches, Price \$1.50.
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Ship Canal (Looking in) two views.
Ship Canal (Looking out).
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The Harbor.
The Bluffs.
"Last Trip from Duluth."

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Coal and Ore Docks. Panoramic View, 7x17 inches, Price \$1.50.

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Lake Vessels Old and New.
Nightfall on the River.
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Str. James Watt Loading at S. S. Ry. Ore Docks.
Presque Isle Ore Docks.
Light House Point.
Steamer Lagonda discharging coal at S. S. Ry. Coal Docks.
Steamers at the S. S. Ry. Ore Docks.

MACKINAC, MICH.
Str. North Land at the Dock.

SAULT STE. MARIE, MICH.
Locking a Big Steamer.
Locks showing high and low level.
The Locks.
General View of Locks from Offices.
Poe Lock, from below, closed.
Poe Lock, from below, open.
Poe Lock, from above.
Poe Lock, with Whaleback.
Whaleback Str. Pathfinder in the Locks.
St. Marys River, South from the Locks.
Weitzel Lock, from above.
Weitzel Lock, from below.
Str. North Land Passing Locks, two views.
Upper Entrance to Lock Canal.
Gate Mechanism.
Interior of Power House.
Canadian Lock from Upper End.
Canadian Lock from Lower End.
Steamers Entering and Leaving Poe Locks.
The Rapids, looking up.
The Rapids, looking across.
Indians fishing in the rapids.

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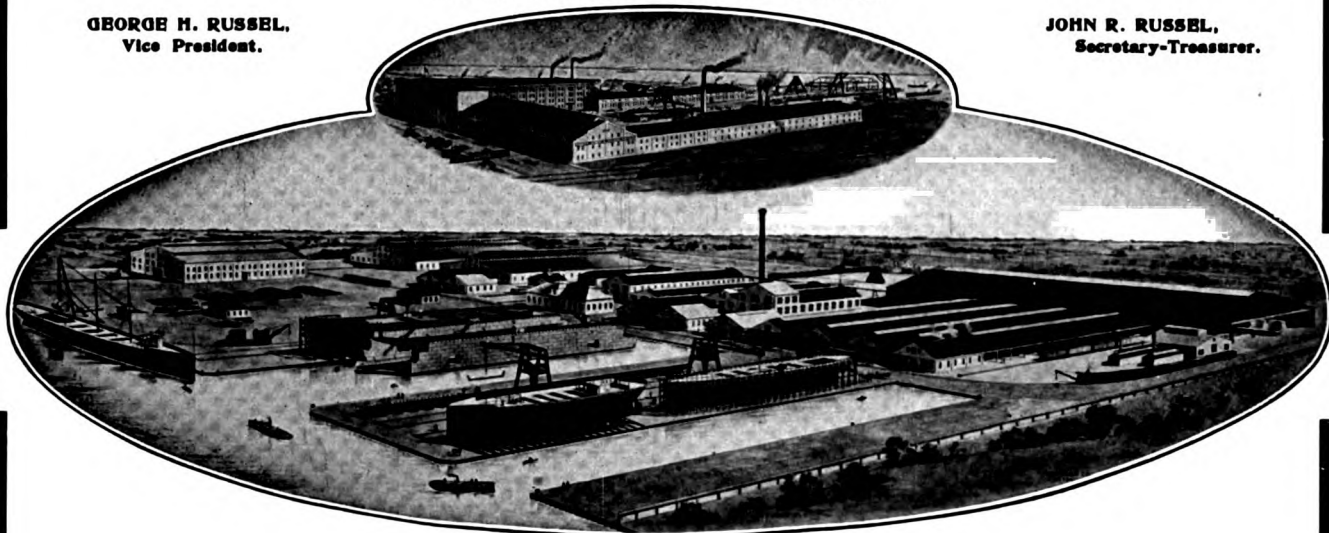
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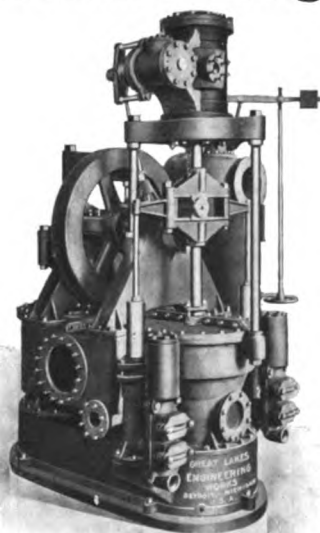
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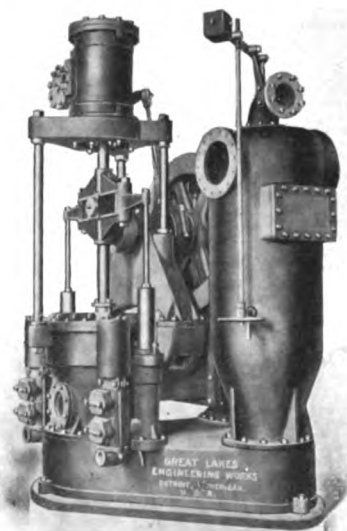
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Italian Royal Navy	- - - - -	32,500 "
Chilian Navy	- - - - -	26,500 "
Argentine Navy	- - - - -	13,000 "
The "Messageries Maritimes" Company	- - - - -	87,600 "
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See accompanying index of Advertisers for full addresses of concerns in this directory.

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Marine Mfg. & Supply Co.....New York.

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Great Lakes Engineering Works.....Detroit.

ANCHORS.
Bowers, L. M. & Co.....Binghamton, N. Y.

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Marine Construction & D. D. Co.....
.....Mariner's Harbor, S. I., N. Y.
Truscott Boat Mfg. Co.....St. Joseph, Mich.
Willard, Chas. P. & Co. Winthrop Harbor, Ill.

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Fore River Shipbuilding Co.....Quincy, Mass.
Georgian Bay Engineering Works.....
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Milwaukee Dry Dock Co.....Milwaukee.
Mosher Water Tube Boiler Co.....New York.
Newport News Ship Building Co.....
.....Newport News, Va.
New York Shipbuilding Co.....Camden, N. J.
Northwestern Steam Boiler & Mfg. Co.....
.....Duluth, Minn.
Quintard Iron Works Co.....New York.
Roberts Safety Water Tube Boiler Co.....
.....New York.
Stirling, The Co.....New York.
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Taylor Water Tube Boiler Co.....Detroit.

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Great Lakes Dredge & Dock Co.....Chicago.
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For Sale Cheap—Brown Hoisting Machinery Co. all iron Post Jib Crane, 15 ton capacity, 35 ft. 3 in. radius of hook, 18 ft. 6 in. lift. The hoisting mechanism is driven by dust-proof motor.

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For Sale.—One 50 H. P. Scotch Marine Boiler, 10 ft. long, 78 in. diameter, 160 lbs. steam pressure. Manufactured by Ritter & Co., Buffalo, N. Y. In first-class shape. For particulars, write The Detroit Stove Works, Detroit, Mich. t. f.

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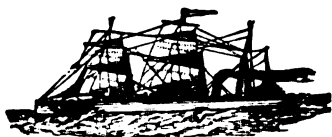
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Fletcher, W. & A. Co.....Hoboken, N. J.
Fore River Shipbuilding Co.....Quincy, Mass.
Great Lakes Engineering Works.....Detroit, Mich.
Hall Bros.....Philadelphia.
Lockwood Mfg. Co.....East Boston, Mass.
Marine Iron Works.....Chicago.
Maryland Steel Co.....Sparrows Point, Md.
Mietz, Aug.....New York.
Milwaukee Dry Dock Co.....Milwaukee.
Mosher, Chas. D.....New York.
Moulton Steering Engine Co.....New York.
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New York Shipbuilding Co.....Camden, N. J.
Northwestern Steam Boiler & Mfg. Co.....Duluth, Mich.
Quintard Iron Works Co.....New York.
Roach's Ship Yard.....Chester, Pa.
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Superior Ship Building Co.....Superior, Wis.
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Lunkenheimer Co.....Cincinnati.
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Mosher, Chas. D.....New York.
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Smith, Stanley B. & Co.....Detroit.
Smith Coal & Dock Co., Stanley B. Toledo, O.

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Lunkenheimer Co.....Cincinnati.

GAUGES, WATER.

Bonner Co., Wm. T.....Boston.
Lunkenheimer Co.....Cincinnati, O.

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Chase Machine Co.....Cleveland.

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Hyde Windlass Co.....Bath, Me.
McMyler Mfg. Co.....Cleveland.
Marine Iron Co.....Bay City.
Mietz, Aug.....New York.

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Falls Hollow Staybolt Co.....Cuyahoga Falls, O.

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Great Lakes Engineering Works.....Detroit.

HYDRAULIC TOOLS.

Watson-Stillman Co., The.....New York.

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Hawgood & Co., W. A.....Cleveland.
Helm & Co., D. T.....Duluth.
Hutchinson & Co.....Cleveland.
McCarthy, T. R.....Montreal.
McCurdy, Geo. L.....Chicago.
Mitchell & Co.....Cleveland.
Parker Bros. Co., Ltd.....Detroit.
Peck, Chas. E. & W. F.....New York & Chicago.
Prindiville & Co.....Chicago.
Richardson, W. C.....Cleveland.
Sullivan, D. & Co.....Chicago.

IRON CASTINGS.

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IRON ORE AND PIG IRON.

Bourne-Fuller Co.....Cleveland, O.
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Pickands, Mather & Co.....Cleveland.

LAUNCHES—STEAM, NAPHTHA, ELECTRIC.

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Marine Iron Works.....Chicago.
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Mietz, Aug.....New York.

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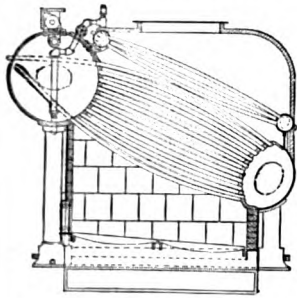
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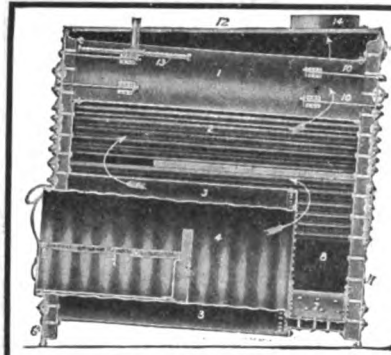


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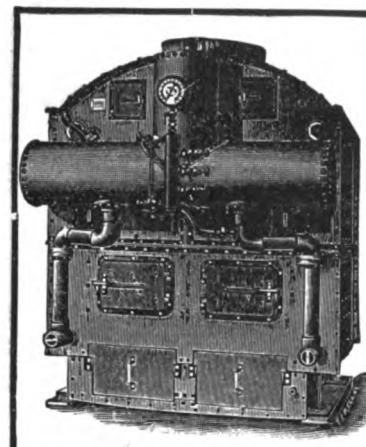


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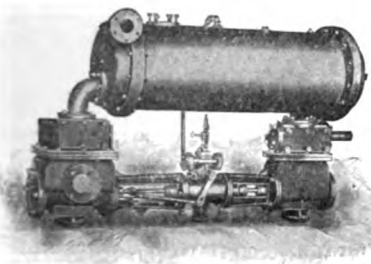
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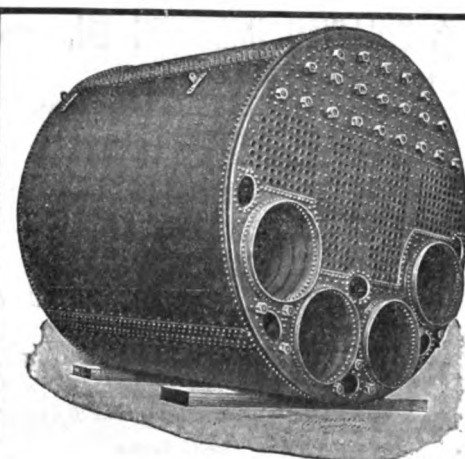
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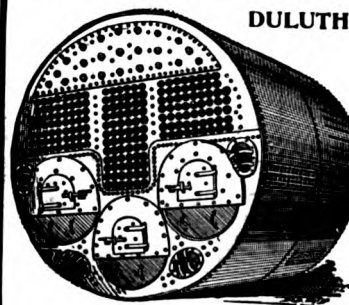
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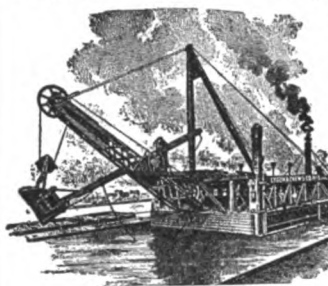
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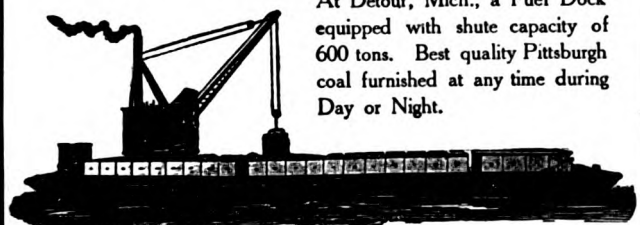
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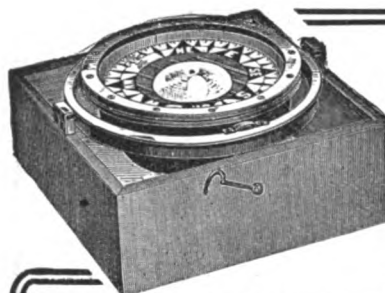
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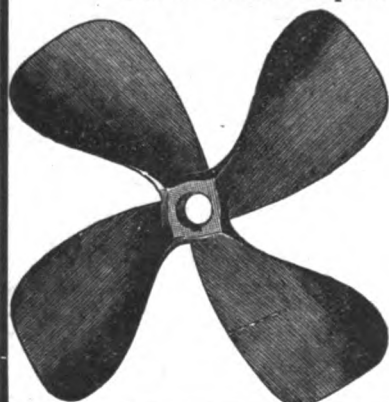
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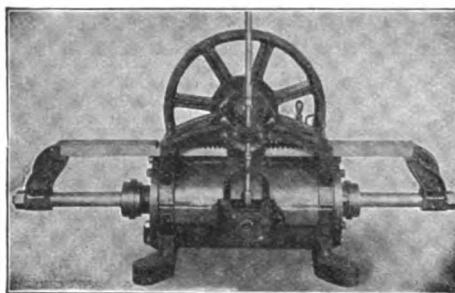
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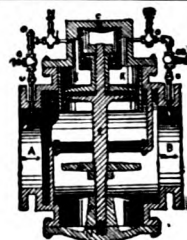
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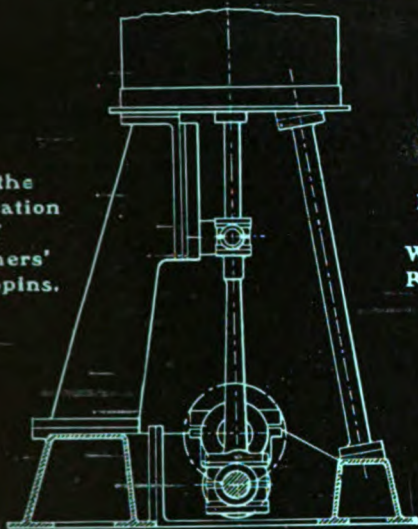
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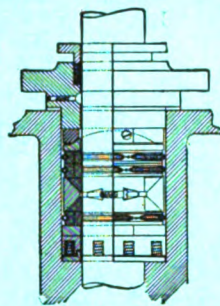
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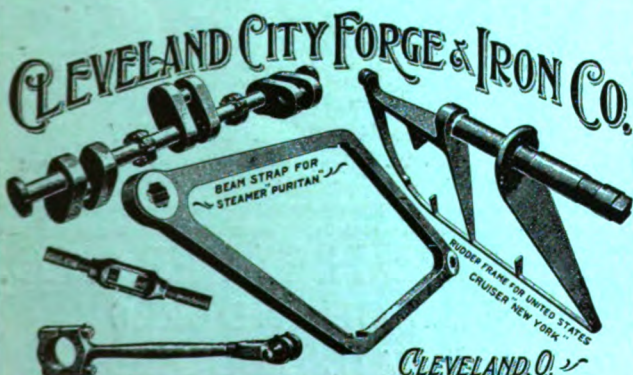
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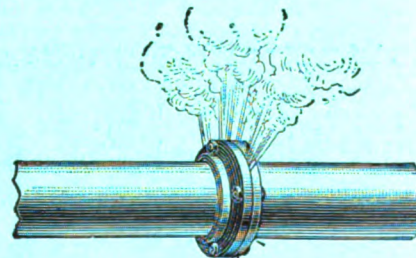
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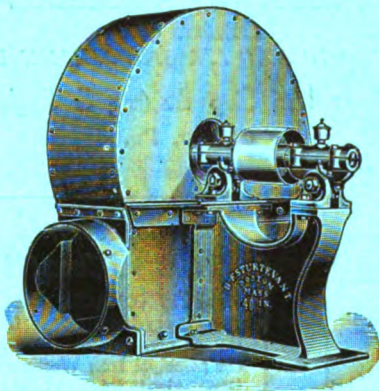
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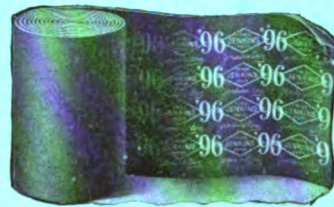
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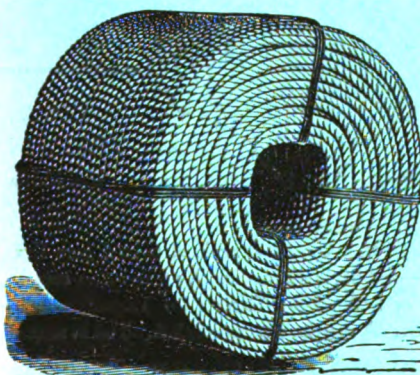
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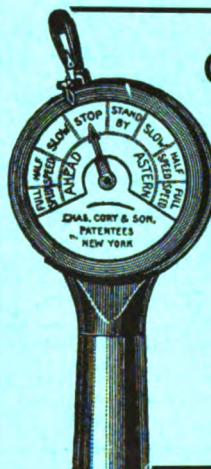
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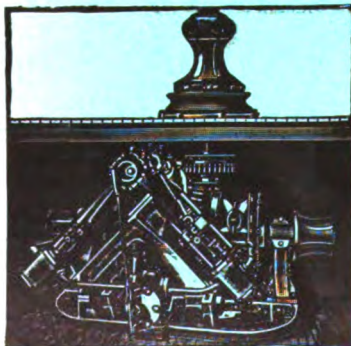
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